Standardization

News Magazine of the American Standards Association, Incorporated

¾ SAFE!

Mask—gloves—apron—But no ventilation

(For welding safety, see page 115)

April 1951

Marginal Notes

Standards for Conservation—

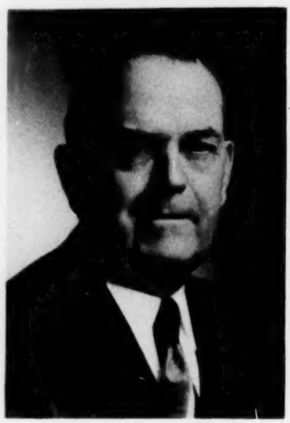
"Scarce materials!" This is the problem that is making headlines and engaging the attention of industrial and government leaders today.

Bill Demarest, secretary of Committee A62 (page 122), puts it: "Can we prepare ourselves to meet the military threat with which we are confronted without defeating our purpose by bringing on economic collapse?"

One answer to this question is safety—protection of manpower as well as property from loss through accident or fire.

Another answer is more effective use of materials through standardization.

Two new American Standard safety codes announced in this issue accomplish both objectives. The "open tank" standard outlines procedures that will protect workmen from debilitating disease resulting from toxic



Oscar F. Lehman

Comment when Mr Lehman was named chairman of the Sectional Committee on Safety in Welding:—"The appointment was made in recognition of Mr Lehman's interest and capacity in this particular field and his many contributions to the general development of industrial safety."

gases and mists. More than that, new data on how various chemicals affect materials used in ventilation systems make it possible to select ventilation equipment that will serve most efficiently and last longer.

Widespread use of welding equipment in small shops and homes throughout the country as well as in industry emphasizes the importance of safety precautions. Even a few accidents such as described by Mr Lehman (page 115) mean serious loss of equipment and materials, not to mention human suffering. Careful attention to recommendations in the new American Standard will save the country both losses.

The government is more actively than ever in the standardization picture (see page 132). Recommendations that it act on standards in the building field (page 120) have broad implications. Although no official announcements have yet been made, unofficial reports from Washington indicate that defense agencies are moving to use the facilities of the American Standards Association.

Our Front Cover

As Oscar F. Lehman says (page 115), welding is a big business today. Unfortunately, only too few of the many individuals who work with welding equipment in garages, machine shops, small repair shops, on farms, and in home workshops, are fully aware of its dangers. The workman shown on our cover wears a protective hood, apron, and gloves. He undoubtedly knows what precautions he should take to prevent fire—by removing fire hazards in the immediate vicinity of his welding job to a safe place. This picture, however, shows the smoke and fumes that develop during welding operations when ventilation is not provided. For this same operation with proper ventilation, see picture on page 115.

In Mr Lehman's article you will find what happens when welding equipment is not handled carefully, and how a newly approved American Standard can be used to prevent injuries to workmen and loss of property.—*Photo Courtesy Chrysler Corporation.*

Opinions expressed by authors in STANDARDIZATION *are not necessarily those of the American Standards Association.*

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Standardization is dynamic, not static. It means not to stand still, but to move forward together.

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ASA
Reg. U. S. Pat. Off.

Ruth E. Mason, Editor   Margaret Chamorel, Production Editor

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Courtesy Western Electric Co

Parts for Bell Telephone equipment receive glistening coats of chromium in this open surface tank. Engineers at Western Electric's Hawthorne Plant have found a novel use for the plastic balls, resembling ping pong balls, shown here. Ten thousand of these little plastic globes crowd the surface of the tank, preventing the chromic acid plating solution from foaming up. This helps to prevent loss of mists that would not only weaken the solution but would also be dangerous to the workman. The use of materials floating on the tank surface to control gases or vapors is recognized in American Standard Z9.1-1951 under Section 10, Control Means Other Than Ventilation. In this photograph the operator has penetrated the mass of "ping pong" balls to extract a sample of chromic acid for testing.

Safety for "*Open-Tank*" Operators

by Arthur C. Stern

THE American Standard Safety Code for Ventilation and Operation of Open - Surface Tanks covers "the protection of operators from contact with gases, vapors, mists or liquids used in, created, released or disseminated by open-surface tank operations and the design of ventilating systems for controlling and removing said gas, vapor, or mist." It applies to "all operations involving the immersion of materials into liquids, or in the vapor of such liquids, for the purpose of cleaning or altering the surface or adding to or imparting a finish thereto or changing the character of the materials and their subsequent removal from the liquid or vapor, draining and drying." It does *not* cover the "protection of personnel, equipment, or structure . . . from fire" nor does it apply to the handling of molten materials or the application of surface coatings by means other than dipping into open tanks.

The intent of the standard is to prevent the emission into the workroom atmosphere of gas, vapor, or mist from open-surface tank operations in objectionable or injurious quantities, and to protect the operator from splash or other contact with liquids injurious to his health.

The standard accomplishes its purpose by classifying open-surface tank operations into 12 classes depending upon the relative need for controlling the gas, vapor, or mist evolved from the tank. For this purpose, tables are included in the standard to allow classification of any open-tank operation from a knowledge of the tank temperature; the boiling point, open-cup flash point, and relative evaporation rate of the liquid in the tank; the maximum allowable concentration in air of the vapor or mist produced; and the extent that the operation produces mist. Ventilation requirements vary with the need for control as expressed by the "classification" of the operation. Thus some operations need control because a small amount of a toxic vapor is produced; some need control because they produce quantities of steam sufficient to obscure vision or to condense on the walls or the ceiling; and still other operations must be controlled to remove mists projected upwards from the tank in a manner akin to the droplets propelled into your eye from a fresh glass of soda pop.

Need for control is therefore specified as depending upon three factors: the severity of the hazard associated with the substance contained in the tank because of the toxic or explosive nature of the vapor, gas, or mist produced therefrom; the relative capacity of the tank to produce gas, vapor, or mist; and the relative energy with which it is projected or carried upwards from the tank.

Once an operation has been classified into a specific ventilation requirement class, the standard allows almost unrestricted choice of means of ventilation. It does this by stipulating for each "class" a minimum control velocity (the minimum velocity of air into the hood at specified points) for enclosing hoods with one or two open sides; for canopy hoods with three or four open sides; and for lateral exhaust with no hood over the tank. The standard also outlines the procedure for computing the ventila-

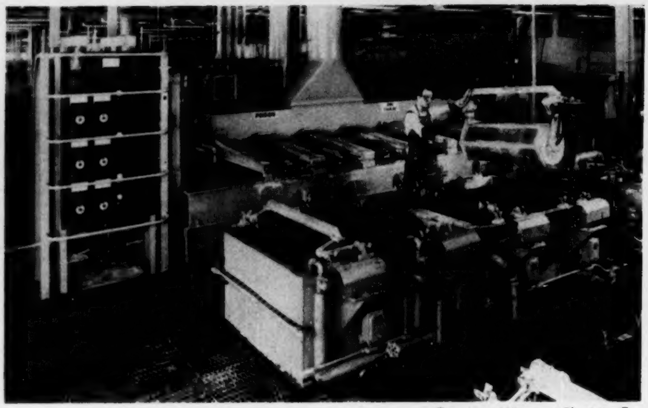
In many plants throughout the country workmen are called upon to spend their working hours standing over or working around open tanks of toxic or irritant chemicals. Automobile parts are lowered into chemicals in open-surface tanks for degreasing; steel bars go through a pickling process; metals are electroplated; textiles are dyed; leather is tanned, bleached, and dressed. The pictures in this magazine are printed from engravings that have been etched by acids in an open tank.

Unless a special effort has been made to protect them, workmen employed in these and other open-tank processes can be exposed to fumes, gases, or mists that may cause serious illness or even death.

The human suffering and loss, lost time, and extra production expense resulting from such exposure is unnecessary. A guide to safe measures that will prevent them is now available in the newly published American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks.

Arthur C. Stern, author of the article above, is chairman of the Subcommittee on Open-Surface Tanks of Sectional Committee Z9 that developed the standard under ASA procedure. Here he tells what the standard does to assure safe ventilation and proper maintenance of the potentially dangerous open vats of toxic chemicals. As chief of the Engineering Unit of the Division of Industrial Hygiene and Safety Standards, New York State Department of Labor, Mr Stern is responsible for the technical measures needed to protect the health of New York State's thousands of workers.

The fact that one leading chemical manufacturer alone produces approximately 150,000 different chemical substances, many of which are potentially toxic and can be safely used only under carefully controlled conditions, is an indication of his problem. Anticipation of the potential hazards created by the use of such materials and the development and perfection of methods of detection, evaluation, and control are the major elements of the Industrial Hygiene Division's program.



Courtesy Western Electric Co

Ventilation equipment here draws off toxic plating fumes. Protected by apron, gloves, goggles, operator is lowering telephone parts into rinsing tank.

tion rate (in cubic feet of air per minute) required to maintain the required control velocity for each hood type, and in appendices includes a number of examples of these computations. The following is a typical example quoted verbatim from Appendix H, of the standard:

1. Boiling water in a 6 × 3-ft tank in an undisturbed location with unbaffled lateral exhaust along the two long sides of the tank.

(*a*) From Appendix A for water: Suggested Hygienic Standard—C; flash point—none; boiling point—212 degrees; relative evaporation—slow.

(*b*) From Table 1: Hygienic Standard is C and flash point is over 200 F. Hazard potential is C.

(*c*) From Table 2: Liquid temperature is over 200 degrees and liquid is 0 degrees below boiling point. Rate of vapor evolution is 1.

(*d*) From Tables 1 and 2: Hazard potential is C and rate is 1. Class is C-1.

(*e*) From Table 3: Minimum control velocity for lateral exhaust for Class C-1 operations in undisturbed locations is 75 fpm.

(*f*) From Table 4: Ratio of tank $= \frac{3}{6} = 0.5$. For a two-sided hood with no baffle, a required minimum control velocity of 75 fpm and a $\frac{W}{L}$ ratio of 0. 5, minimum cfm per sq ft of 170 is required.

(*g*) Tank area = 6 × 3 ft = 18 sq ft.

(*h*) Minimum ventilation rate required = 170 × 18 = 3060 cfm (half through each side hood).

Seven pages of typical exhaust designs are included in appendices to the standard.

Rules on personal protection in the standard call for the use of gloves, aprons, and shoes to protect workers exposed to toxic liquids. Rules for operation of open-surface tanks provide for maintenance of the air flow and for proper circulation of fresh air. Inspection, maintenance, and installation are considered sufficiently important to warrant a special section. Because cyanide compounds and solutions are potentially dangerous in the presence of acids, special precautions for cyanide are outlined. A separate section also gives information on protection for vapor degreasing tanks. Provision is made to allow the use of both control means other than ventilation, and methods of ventilation involving supplied as well as exhausted air. When an operation has both a low hazard potential and a low rate of gas, vapor, or mist evolution, general room ventilation by either natural or mechanical means is considered safe and acceptable as the control means.

One of the most valuable contributions of this standard to industry is the inclusion in an appendix of tables of the resistance to corrosion of materials used for hoods, ducts, and exhaust fans. These tables are discussed at greater length elsewhere in this issue by Mr J. W. McWilliams of the Eastman Kodak Company, who was primarily responsible for their development.

Copies of the American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks, Z9.1-1951, are available at 75 cents each.

The Open-Tank Standard is the work of the ASA Sectional Committee on Safety Code for Exhaust Systems, Z9, of which Professor T. F. Hatch, University of Pittsburgh, is chairman. The organizations sponsoring this sectional committee are the American Industrial Hygiene Association, the American Society of Heating and Ventilating Engineers, and the National Association of Fan Manufacturers. This standard replaces the former American Standard for Safety in Electroplating Operations, Z9.1–1941. Although it is quite different in content and format, the new Open-Tank Standard may be considered a revision of the Electroplating Standard.

Work on the Open-Tank Standard started on May 4, 1948, with the appointment of the author as chairman of a subcommittee of his own choosing to prepare a draft standard for submission to the Z9 Committee.

Drafting of Standard

The Subcommittee included some members of the Z9 Committee as well as some nonmembers. It consisted of: S. E. Barr, Metal Finishing Engineer, Western Electric Co; E. R. Bowerman, Engineering Research Department, Sylvania Electric Products Inc; A. D. Brandt, Medical Division, Bethlehem Steel Corp; H. F. Brush, B. F. Sturtevant Co; H. B. Diggin, Technical Director, Hanson-VanWinkel-Munning Corp; W. B. Harris, Medical Division, United States Atomic Energy Commission; N. V. Hendricks, Standard Oil Co of New Jersey; M. G. Kershaw, E. I. du Pont de Nemours Inc; J. W. McWilliams, Chief Technical Engineer of Plant Engineering, Eastman Kodak Co; B. Postman, Employees Mutual Liability Ins Co; L. Silverman, Associate Professor, Harvard School of Public Health; A. W. Smart, Peters-Dalton Inc; O. G. Stam, Bakelite Corp; G. E. Wallin, Application Engineer, DeBothezot Fans Division, American Machine & Metals

(*Continued on page* 133)

A USER'S VIEWPOINT —

Corrosion Data Helps Select Ventilation Equipment

by Joseph W. McWilliams

Chief Mechanical Engineer of Plant Engineering, Camera Works, Eastman Kodak Company

As Chief Mechanical Engineer of Plant Engineering at the Camera Works, Eastman Kodak Company, Mr McWilliams supervises the installation of all mechanical and structural facilities for both building structure and building services. His group is also responsible for installation of all facilities for production, staff services, and other occupancies. Designs, estimates, specifications and contracts, field followup and inspection, and cost control are all part of his job. His experience in establishing or rebuilding various dipping, pickling, and electroplating facilities has been especially valuable to the Z9 committee.

HOW often has it happened that the pickling department or plating room foreman has called the sheet metal shop with an order to "put an exhaust on the new dip tank because there are too many fumes"? For lack of adequate basis of design, this has often been the method used in the past to control fume hazards in the worker's breathing zone.

The past ten years have seen tremendous changes in electroplating and chemical treatment of metals, as well as the widespread use of new chemical substances in many other types of manufacturing. The general tendency has been to make old processes more effective by using higher temperatures, mechanical agitation, and more active ingredients in the solutions, each of these resulting in greater generation of gases, mists, or vapors.

No longer is it possible to order ventilating hoods for a group of tanks built with makeshift planning to an arbitrary exhaust rate. The hazards now are so great and variable that each must be recognized and carefully controlled.

Information Available

Under the urging of industrial hygienists, chemists, and engineers, the basic factors have been established for most common chemicals used in open-tank operations. This information has been assembled in a practical manner and is included in the new American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks, Z9.1–1951. From it the operation may be classified according to the hazard potential of each chemical and according to the conditions of its use. With the established classification, necessary control velocity may be determined for any standard type of exhaust hood.

The new code correlates the types of hood and the rate of exhaust with the size and shape of the tank. From these, the actual quantity of air to be exhausted is readily determined to produce the necessary control velocity.

At this point the exhaust system may be sized. Yet to be determined is the material to be used in the hood, duct, and fan which will resist the corrosive action of the fumes carried in the system.

To assist the user in selecting a suitable material, Appendix F was created; Part 1 being for hoods and ducts, and Part 2 relating to exhaust fans.

The Committee[1] realized that there is a wide variation in the need for exhaust system life, depending on whether it is for experimental pilot line use, or full-scale production. In addition, the scope of operations varies from the small job shop with a few tanks used on intermittent basis, to the round-the-clock operation of automatic conveyorized tanks in the appliance and automotive plants.

The decision was made to circulate a questionnaire to industry in order to draw on the experience of many people in the actual use of specific materials on open-tank operations. Questionnaires were distributed to about 130 industrial plants, and about 40 replies were received.

The wide use of open-tank operations would seem to make available a large amount of data on the use of duct materials but the survey results reflected the huge change which took place due to conversion from peace to war and the reverse condition. In the course of such changes, systems were removed and personnel shifted. Then, too, the records on such work are often inadequate from the very beginning due to the manner in which jobs are planned with little or no specification and without close checking of the installation.

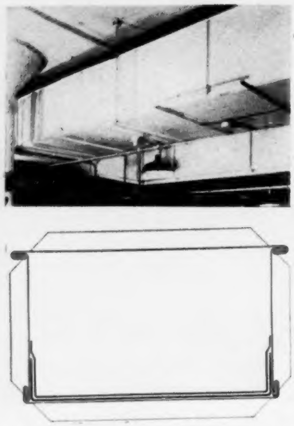
Sources of Information

The principal sources of information were from the steel mills, electrical motor and appliance manufacturers, electroplating companies, a few scattered reports from aircraft, implement, dyeing, and apparatus plants, as well as data from experienced vendors of process equipment. As the tables indicate, the actual useful life in years was one gage. However, this was tempered somewhat by the general classification of the materials into categories of excellent, satisfactory, fair, and poor.

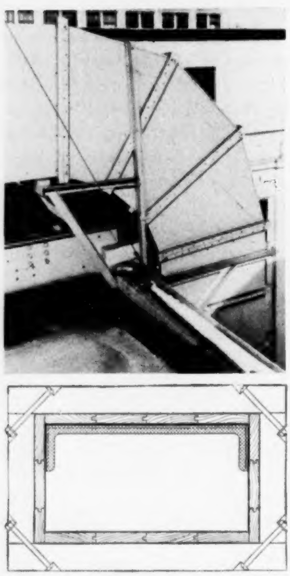
From the reports, it was shown that unprotected black iron and gal-

1. The committee referred to here is the Subcommittee on Open-Surface Tank Operations which reported to ASA Sectional Committee on Safety Code for Exhaust Systems, Z9. Arthur C. Stern (see article on page 109) was chairman of this subcommittee.

vanized iron are used for practically every type of operation. The results reported varied so widely as to make evident the need for other materials with consistently better qualities on all operations involving acids, mixed fumes, and condensed vapors. Wherever the tables show indefinite ratings such as E-P, users have reported results ranging from excellent to poor, so that caution is necessary before using such a rated material for the use on which it is so rated.



Type I



Type II (a)

Several duct designs in current use at Camera Works of Eastman Kodak Company may be of interest and are briefly described here in connection with data from the tables.

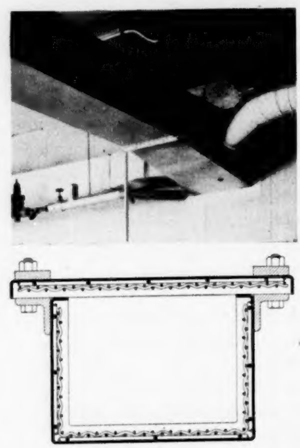
Galvanized Sheet Steel Duct

Type I illustrates a cross section of a galvanized sheet steel duct which is protected on the horizontal runs by two layers of felt membrane imbedded between 3 mop coatings of hot asphalt (200 F melting point) on bottom and 6 inches up the sides. The balance of the duct, both horizontal and vertical, is mopped very carefully with asphalt. Type I is shown in use as the main duct on a sulfuric anodizing system eight years old. To facilitate operations, the top of the duct is left off until the bottom lining is complete, and then section by section the cover is placed and the final asphalt mopping done.

California Redwood Duct

Type II (*a*), shown in section, is a California Redwood duct built in 8-foot sections of tongue and groove boards, and is illustrated in use on a chromium plating system about five years old. The bottom of the duct is protected with ½ inch of hot asphalt poured previous to installation. The asphalt is reinforced by a steel mesh anchored to the wood. The vertical runs are not protected. This type of duct has been in use for over 20 years handling fumes from a metal cleaning, pickling, and plating department in another area not illustrated here.

Type II (b)



Type III

Marine Grade Plywood Ducts

Type II (*b*) shown in section is a ¾-inch thick marine grade plywood construction with all ducts built in nominal 8-foot lengths. Horizontal runs are protected the same as Type I. Vertical ducts are painted two coats of phenolic resin base paint. This construction is illustrated in use on a metal cleaning and pickling system about four years old. The operation in the foreground is a cleaning tank with a plywood hood. This connects to the plywood main duct by means of a painted metal branch duct. Notice that the ends of the large elbow section are butted to the adjacent transition sections. Sections are built up with waterproof glue between members.

Ten-Gage Steel Duct

Type III, shown in section, is a 10-gage steel duct lined with ¾-inch

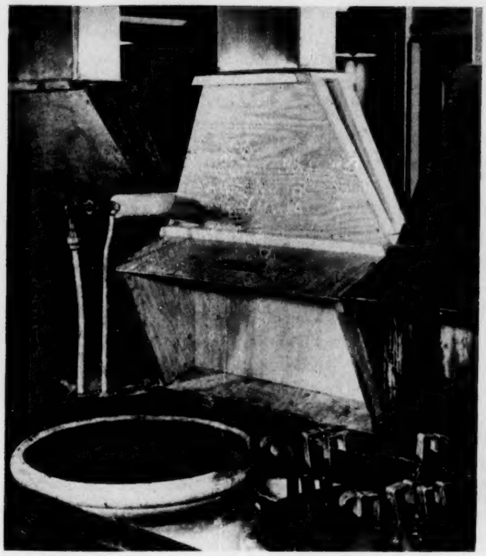


Fig. 5

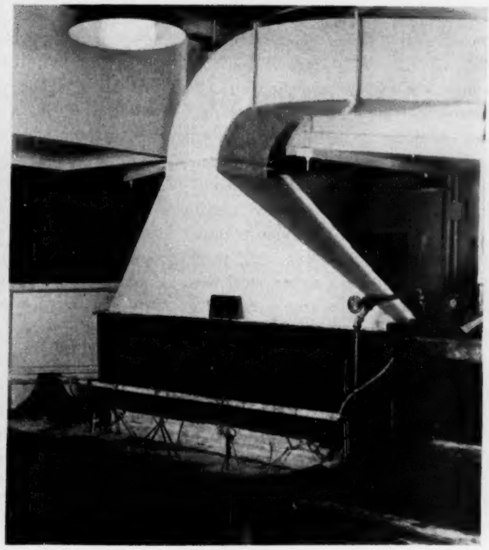


Fig. 6

Descriptions and drawings of exhaust hood designs that may be most helpful to companies with ventilation problems are given in Appendices in the American Standard on Open Tank Operations, Z9.1-1951. Most Eastman Kodak operations require the use of lateral hoods, as shown here. The information on lateral hoods is in Appendix C. Appendix B gives information on enclosing hoods; and Appendix D on canopy hoods.

For ready reference purposes the hoods shown on this page are identified by the same figure number as used on the corresponding hood drawing in Appendix C.

Figure 5 shows a varnished plywood hood that meets the requirements of the drawing shown in Figure 5 of Appendix C. The Appendix recommends that the hood extend over the tank as far as use of the tank will permit. Although not required, a baffle and end shields are considered desirable. The hood pictured is used for acid dip operations.

Figure 6 shows a steel hood sprayed with asphalt and asbestos covering. This is considered to be most effective in a phosphatizing operation. In this particular case the tank could not be obstructed overhead and therefore the hood has been designed in accordance with Figure 6 of Appendix C of the standard.

The hood shown in Figure 8 is made of stainless steel (AISI 316). A nitric acid aluminum polishing operation is carried out at the right; a cold water rinse on the left. Eastman's present plans call for addition of a baffle between the two tanks, and an end baffle on the acid tank due to excessive drafts from the fresh air system. The American Standard Z9.1-1951 provides the basis and necessary information for computing the total quantity of air required to be exhausted from each tank.

Figure 10 is a black iron hood, its exterior coated with vinyl type paint. It is used for chromium plating. The hood extends along each of the long sides of the tank. This type of hood is particularly effective for heavy mists and vapors.

Fig. 8

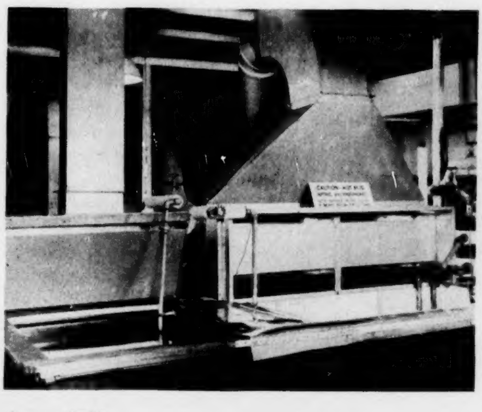
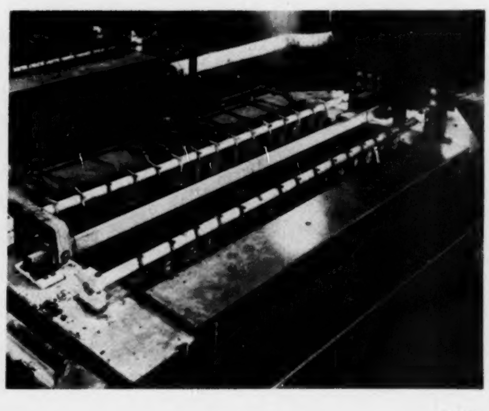


Fig. 10



13-gage expanded metal and protected with a lining of $\frac{1}{2}$-inch thick hot asphalt. This duct is built in convenient lengths with flanged ends bolted together. The horizontal runs are actually troughs, with covers bolted on after the end joint is tightened and mopped to seal the crack.

This duct is illustrated in use on a chemical laboratory fume removal system about six years old. It replaced an asphalt painted steel duct which failed in about two years.

In addition to the ducts described previously, we have comparative data on other materials commonly used but not illustrated. These are shown in an economic study in Table I.

Note that the cost data presented here are not included in Appendix F as the figures are subject to great change and are representative only of the specific experience in our plant. The committee felt that each user would need to determine which of the locally available materials is suitable for his project and establish the economics for the materials. It is known that rapid developments are taking place in the use of plastics on which no reports were available.

TABLE I

Economic Study of Relative Cost and Probable Length of Service of Commonly Used Duct Materials under Different Service Conditions

Relative Cost and Life of Typical Duct Materials		Type of Service or Operation					
		Neutral and Alkaline Such as Washing, Degreasing		Mild Acid Fumes Such as Electroplating		Severe Acid Fumes Such as Metal Cleaning, Pickling	
Duct Material	Approx Installed Cost Per Sq Ft of Duct Surface*	Life in Years	Cost Per Year of Useful Life	Life in Years	Cost Per Year of Useful Life	Life in Years	Cost Per Year of Useful Life
Galvanized Steel 22 gage, rectangular soldered joints	2.00	5	0.40	1	2.00	½	4.00
Galvanized Steel with 2 coats asphalt paint	2.40	10	0.24	2	1.20	1	2.40
Galvanized Steel with mopping of 200 F hot asphalt	2.40	10	0.24	5	0.48	2	1.20
Galvanized Steel with asphalt and membrane, Type I	2.80	10	0.28	10	0.28	5	0.56
$1\frac{5}{8}$-in. Calif Redwood, Type IIa, or $\frac{3}{4}$-in. Plywood, Type IIb	3.80	10	0.38	10	0.38	5	0.76
$\frac{1}{8}$-in. Steel with metal mesh and asphalt, Type III	5.60					10	0.56
$\frac{3}{16}$-in. black steel lined with $\frac{1}{8}$-in. lead sheet	6.50					10	0.65
$\frac{3}{16}$-in. black steel lined with $\frac{1}{4}$-in. three-ply vulcanized rubber	7.00			10	0.70	10	0.70

Blank spaces denote lack of information. Ducts exposed to weather are painted on exterior at about 5-year intervals.

* Based upon the total installed cost of actual systems averaging about 125 ft in length horizontal, plus 75 ft vertical, and handling from 15,000 to 50,000 cubic ft per minute; prices corrected to early 1950.

Protected Duct Material Most Economical

From the data presented in Table I it is apparent that in long-term operations a protected duct material is most economical. Also, with the more corrosive fumes, greater initial cost is justified. For those companies whose operations do not permit shutdown for repairs, the loss due to breakdown may be far greater than the saving involved in the ductwork so that only the most highly rated materials may be suitable.

The information presented on types of hood designs in Appendices B, C, D, and E is of great interest as it again presents much information which is readily applicable to many operations. Most of our operations require the use of lateral hoods, which are described in Appendix C, and a few of these are shown (p 113). The figure designations used are those from Appendix C of the code.

Basic Information Contained in Code

The code contains much useful data to assist in the design of exhaust systems for open tanks. It is no final answer to problems of that sort, as specific conditions may necessitate considerable variation from code recommendation. However, the basic information presented will definitely produce proper results for the usual operations required by industry. As in all safety codes, careful investigation of the operation is essential so that a good application is made. The importance of complete engineering drawings, and specifications is only overshadowed by the necessity for having reliable construction sources and close inspection of the installation as it progresses. Deviation from plans and damage to linings in transport and during installation can seriously affect the quality and life of any system.

BE CAREFUL!

Welding Can Be Dangerous

by Oscar F. Lehman

JUST recently, I read with interest what started out to be the success story of an automobile dealer in a Mid-Western city but finished as a recital of disaster that was the more horrible because it so easily could have been prevented. By hard work, intelligent management, and a consuming desire really to serve the motoring public, this dealer had built up a fine business. In due time he outgrew his original facilities, even though he had made numerous additions to them.

Finally, he was able to realize his life's ambition and build a plant that measured up to the ideals that he long had nurtured. The new building incorporated all the modern ideas of successful dealerships. It was large, handsome, practical in layout, splendidly equipped with service tools, exceptionally rich in all the things that go to make for the comfort of customers. It was by far the finest dealer establishment in the area, a "show place" measured by any standards. The $200,000 that it cost seemed to have been excellently spent.

As Safety Engineer of the Chrysler Corporation, Mr Lehman is credited with a remarkable record in cutting down accidents in his company. His program of safety instruction has had the full support of his company's executives. Mr Lehman is chairman of the Sectional Committee on Safety in Electric and Gas Welding and Cutting Operations which developed American Standard Z49.1-1950. The committee works under the procedure of the American Standards Association and is sponsored by the American Welding Society. Mr Lehman represents the Automobile Manufacturers Association on the committee.

Copies of the American Standard Safety in Electric and Gas Welding and Cutting Operations, Z49.1-1950, are available at 50 cents each.

The day of the formal opening was the happiest day of the dealer's life. The building was dedicated with fitting ceremonies, including a banquet, music, entertainment, souvenirs, etc. The whole town turned out to do him honor; the radio and newspapers saluted him as befitted a farsighted merchant and a good citizen. The community was happy that a fellow-townsman had done so well for himself.

Then came stark tragedy. Even before the dealer had found time to read all of the congratulatory messages on his new establishment, his service department received a telephone call to pick up a car that had been badly damaged in a collision. It was found that considerable cutting and welding would have to be done to make the necessary repairs. The body of the car was taken off the chassis and then the gas tank was removed and placed against the wall, some six or eight feet from where the chassis was standing. This tank was nearly filled with gasoline when detached from the car.

Then the cutting and welding operations on the chassis began. Within a few minutes, there was a blinding flash and a terrible roar—the gasoline tank had exploded. Two mechanics were caught in the fire, which quickly spread to other cars and

Courtesy Chrysler Corp

Compare this with the cover picture! Here, proper ventilation removes smoke and fumes. Welder also uses protective gloves, apron, sleeves, and mask.

Courtesy Chrysler Corp

Aprons, sleeves, gloves protect both gas welder (left) and electric welder (right). Tinted glasses are sufficient protection in gas welding but easily adjustable mask gives quick protection when workman changes to electric welding.

trucks in the shop, as well as to stores of paint, oil, and grease. Soon the whole building was a raging inferno and the flames had such a start that the Fire Department was helpless to save it. Building equipment, office records, and several new automobiles were completely destroyed.

Worst of all, the two mechanics who had been working on the wrecked car were burned to death, sacrifices to carelessness, or to an inadequate knowledge of the proper precautions to take on a welding job. The official investigation proved that the gasoline tank had been leaking and that its contents had been ignited by sparks from the welding torch. Two human lives and almost $200,000 in property were lost simply because the gasoline tank had not been put in a safe place.

Only this morning a radio news commentator told of a similar accident that caused many thousands of dollars' damage to a building and its contents, with 1,000 workers idled. And the cause, again, was sparks from a welder's torch igniting flammable materials left too close to the work.

Almost daily, the newspapers print accounts of similar catastrophes, not all of them, fortunately, so damaging as those already related, but nevertheless costly in injuries to workers and property destroyed.

The inescapable conclusion is that while welding, when conducted according to sound safety rules, is one of the most necessary and useful processes we have in manufacturing and building; it is one of the most dangerous operations known to industry unless workers are careful and are fully informed of procedures needed to eliminate its hazards.

Today, welding is a big business, whether it be in the construction industry, automotive industry, agricultural industry, transportation industry, in public utility corporations, communications, and many more. Even the many domestic items we purchase for use in our homes have been welded.

New and Better Methods

Inventive genius has brought about the development of new and better methods of welding. With progress, accidents, health hazards, and fire hazards began to multiply. It soon became apparent that controls were necessary. Safety rules, regulation in health hazards, fire prevention, all were developed to make controls possible.

Standardization has brought about uniformity in welding equipment, from nipples and fittings to welding torches and welding tips, regulators, gages, and valves, including safety devices to protect this equipment. Electrode holders and electrodes and numerous other items are in use every day. Welding has become so practical that its use is now virtually worldwide.

Safety Is Essential

The elimination of accidents, conservation of health, and fire prevention are partners for economy in operations. Now, as never before, safety is essential. No country, no matter how rich in natural and human resources, can afford a several billion dollar economic loss each year through accidents and fire. Fires and explosions alone account for the loss of 10,000 or more lives and a terrific property loss annually in the United States.

Where do most of these fires happen? A brief analysis would indicate, first, the more densely populated areas that comprise our cities. Here we find a well-organized system of fire controls, fire fighting equipment, educational programs that begin with children in our schools, adult education, etc. Here, too, we find our larger industrial areas where planned programs and procedure in accident prevention and the elimination of fire hazards are as much a part of our daily activities as is the building of our products.

The picture changes as we travel from the city to the suburban areas where the population spreads out. Here, protection and controls are fewer. Here, too, small repair shops and service stations escape the close controls of local and state factory inspection service. As we journey from suburban districts out into the rural areas, it is not unusual to see familiar signs along the highways "General Repairs and Welding" with an arrow pointing toward the small cross-road shop. A little farther along, we come to a small village with a hand-painted sign indicating that here is another repair shop. Again welding is indicated. If the

village is large enough, perhaps there is an automobile agency with the customary service garage in the rear. The larger towns support from two to a number of such sales and service stations with each using welding equipment.

Today, we find thousands of installations of this kind throughout the country. Where did this equipment come from? It came from the mail-order catalog used by the farmer who wishes to set up his own repair shop and who buys what he thinks will be sufficient for his requirements. It comes from the catalog in the local hardware dealer's store, where the owner of the small repair shop can select for his needs as he sees them. It also comes from the traveling salesman who sells everything, from a cross-eyed darning needle to a railroad engine. So, we have graduated from the village blacksmith and his shop where welding was under comparatively safe conditions, regardless of how crude the methods were at that time, to our present-day electric and gas welding and cutting operations.

It is this new, more modern equipment that is being placed in the hands of inexperienced and untrained individuals that is giving us the greatest concern.

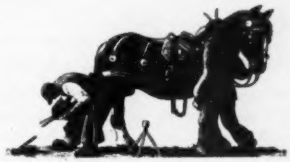
Printed instructions in the care, use, and maintenance of this equipment are often too limited in their scope to give the user full information that will protect him from situations that arise from time to time and that too frequently lead to disastrous results.

"An American Standard"

What is the answer? An "American Standard." Recently, a sectional committee made up of representatives of the groups concerned, prepared a revision of American War Standard Safety in Electric and Gas Welding and Cutting Operations, Z49.1-1944. This revised standard, approved by the American Standards Association, is now American Standard Z49.1-1950. In booklet form, it is just off the press. It contains valuable information and advice—from the installation, care, use, and maintenance of acetylene generating units, including portable acetylene and oxygen units, to the manifolding of acetylene and oxygen cylinders generally piped into production areas and requirements for portable electric arc welding and resistance welding machinery. The standard points out too that information is available from other reliable sources—from the National Electrical Manufacturers Association, National Fire Protection Association, National Board of Fire Underwriters, American Welding Society, U. S. Bureau of Mines, and many others.

The American Standard is instructive and emphatic in its recommendations. Where imperative action is necessary, the word "shall" indicates a "must" from the standpoint of absolute safety in the elimination of accidents, prevention of fire, and health control. For example, the subject of Section 6 on page 31 of American Standard Z49.1-1950 is Fire Prevention and Protection. Article 6.1 sets forth the basic precautions for fire prevention in welding or cutting work as follows: Article 6.1.1—Where practicable, move the object to be welded to a safe location designated for welding. Article 6.1.2—If the object to be welded cannot readily be moved, all movable fire hazards in the vicinity *shall* be taken to a safe place. Article 6.1.3—If the object to be welded cannot be moved and if all the fire hazards cannot be removed, then guards *shall* be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards. Article 6.1.4—If the rules stated in 6.1.1, 6.1.2, and 6.1.3 above cannot be followed, the welding and cutting *shall* not be performed. Special emphasis on article 6.1.2 clearly indicates that the observance of this short, simple rule would have saved a $200,000 investment and the lives of two workmen. American Standards are positive protection and definite insurance against losses which we can ill afford at any time and, particularly, during the present world crisis.

IN the early centuries, artisans working with metals knew something about their fusion. Iron, steel, and copper were fashioned into implements for domestic use and for weapons of warfare. Their processes were secrets? Perhaps. Nevertheless, they were handed down from father to son, and from generation to generation.



N. Y. Public Library Picture Collection

The old village blacksmith shop was an interesting place when I was a boy in my teens. I vividly recall watching the smith working with metals of all kinds, seemingly a master of them all. I remember, too, how important I felt when he asked me to pump the bellows that supplied forced draft to the fire in the forge where he had placed the metals for preheating prior to being welded together.

Did I say "welded together?" Surely I did, for the village blacksmith in those days was an expert welder. He performed skillfully such operations as the forming of a horseshoe, the welding of the toe calk to complete the shoe, and the welding of a new point on a plowshare for the farmer. When the steel rim on a wagon wheel became loose, he would cut out a section, taper the ends, weld them together, and then heat the entire rim, placing it over the wooden felloes, pounding it into place, and throwing cold water upon it. As it cooled, the shrinking of the tire tightened it on the rim and the wheel was again as good as new. How about welding fluxes? Sure, the old time blacksmith used a welding flux—just one flux as I recall. He said it was a borax powder. Our mothers used it to soften hard water to make washing easier—he used it in the fusion of metals, or welding as we know it today.—*Oscar F. Lehman.*

Recent Rulings on Unusual Accidents

How are unusual accidents to be counted in compiling a company's safety record? This is the question that constantly comes to the Committee of Judges, Sectional Committee Z16 on accident statistics, for decision. The Judges have ruled so far on some 140 cases. Seventy-one of these cases have already been published. Reprints are available from the American Standards Association. Cases 75 through 84 are reported below.

CASE 75. The injuries were a cerebral concussion and two lacerations of the scalp. The disability and lost time was caused by the cerebral concussion.

While doing work to which he was assigned, the injured bumped his elbow. This caused no injury; however, there was some pain. He stated to the men who were working with him that he had struck his "crazy bone." After stepping back a few steps from the machine on which he was working, he fainted and fell backwards, striking his head on a valve.

The injured had a record showing he had fainted on previous occasions. The disabling injuries sustained in the fall were the result of this weakness over which the employer had no control.

The company wanted to know if this should be classified as an industrial injury.

The committee agreed that this case should be classified as an industrial injury on the basis that the employee had fallen and hurt his head on a valve and hence the injury was of industrial origin.

NOTE: Case 76 omitted. Committee asked for additional information before making a decision, but it was not provided. Case was closed without a decision.

CASE 77. An employee was taking 100-pound bags off a chute table, which was about 42 inches high, and placing them on a two-wheeled hand truck. In the ordinary pursuit of his work, as he was transferring one of these bags in his arms from the table to the truck, without any slip, fall, or sudden jerk of any kind, he felt a pain in his groin. The pain was so severe that he dropped the bag, straightened up, and took a deep breath. By that time the pain was relieved sufficiently so that he could continue working. The company wanted to know if this hernia case should be included in the rates.

The committee believed that the history given justified counting this in the rates as a hernia meeting the provisions of paragraph 2.2 of the code.

NOTE: Case 78 omitted. Committee asked for additional information before making a decision, but it was not provided. Case was closed without a decision.

CASE 79. Two men, whose job it was to grind glass stoppers, were injured. Their regular job involved dipping their hands in water which contained carborundum dust.

The plant doctor felt that neither of the men should continue his regular work because of the irritation that might result from the grinding compound. However, he did state that the employees could perform other regular jobs in the department. They were, consequently, moved to other work in the same department.

One of the men worked for three days and the other worked for one day. They then consulted with their union representative and were advised to go home. The reason was that the union felt they should not do any work except their job of stopper grinding—a skilled job. The plant raised this question—since other regular work was available, although it was not in their regular skill, and since both men for a time performed the other work immediately after their accidents, should these accidents be taken as temporary total disabilities?

The committee agreed that the injuries to these two employees should not be included in regular industrial injury rates. This decision was made upon the basis that there was a regular job open and available in the plant, to which these employees could return and in fact they did return to this job for a short period. Their inability to work was not attributable to their injury except indirectly. The primary reason for their absence was essentially a labor dispute.

CASE 80. A company wanted to know if the following accident should be considered as arising out of and in the course of employment:

A janitress entered the women's rest room to "straighten things up." While in the room, she noted a large fly which she decided to kill. She knocked the fly to the floor with a broom and since the fly was only stunned, she attempted to step on it. As her foot decended on the fly, it struck the edge of a concrete step, resulting in a chip fracture of one of the bones in her right ankle and several weeks of lost time. The women's rest room was partitioned in two sections; one containing lounge facilities and the other the toilet and wash basin. The section of floor containing the wash basin and toilet was about 5 inches higher than that of the lounge. The employee's foot struck the edge of the raised section of concrete flooring.

The committee agreed that this should be considered an industrial injury on the basis that this employee was carrying out the duties of her employment at the time she was injured.

CASE 81. A laborer was affected by an accidental release of SO_3 fumes which caused him to cough. While coughing, he noticed a burning sensation in the stomach area and a lump rose immediately. Another employee witnessed the incident.

This occurrence happened on May 18, 1949 at 11:45 a.m. The injured reported the same day to the dispensary attendant. He was referred to the doctor on the following day, May 19. The doctor reported as follows: "Separation of muscles resulting in small ventral hernia—above umbilicus."

The employee lost no time. He returned to his normally assigned duties.

Questions for decision:

1. Because the injury is called "hernia" is this to be considered a disabling injury?
2. If so, should the standard time charge of 50 days be made as in the case of an inguinal hernia?
3. If the standard time charge does not apply in this case, what time charge, if any, should be made?

The committee agreed that in accordance with the report this injury was a hernia; therefore it should be reported in the rates, in accordance with paragraph 2.2. In accordance with paragraphs 4.4.1, the time charge should be shown as 50 days.

Some of the members of the committee expressed the opinion that the drafting committee, in preparing the 1945 edition of the code, probably had not contemplated the type of hernia described in this report. Since the code makes specific provisions for hernias, however, the committee had interpreted that this provision applies to all hernias. This paragraph may come up for further consideration, in connection with a revision of this code.

CASE 82. An employee was changing into his work clothes in the plant changehouse. As he pulled on his trousers he was bitten

on the inside of the upper leg. He found a spider. He became ill, ran a temperature, was hospitalized and lost time from work. It was established that this was a Black Widow spider. Since paragraph 2.5 did not mention "insect" bites the company asked for a ruling on this case. It believed that if insect bites should be included then the paragraph should be corrected to so indicate.

It was the opinion of the Committee that insect bites, although not specifically mentioned, should be treated the same as animal bites as stated in 2.5 of the standard. It therefore agreed that this injury should be considered an industrial injury.

CASE 83. A plant changed from one type of bottle machine—now outmoded—to a newer type. One of the machine operators, who had been employed steadily since the plant was built—some 10 years—began to complain about the heat after he was transferred to the new type of machine. The change in machine had not significantly affected the heat conditions in the department. The man was transferred to another department, however, where part of the work was in the vicinity of the machines but most of it was in a machine shop. The man still said he was bothered by the heat and felt he was about to pass out.

The employee was first sent home and then to the hospital. The doctor believed that the employee was suffering from a mental rather than a physical condition and that the heat in the plant had nothing to do with it. When the doctor discussed the case with the employee and told him he thought it was a nerve condition the man admitted this was true. The employee said he had been aware of it for some time and he had been going to a psychiatrist for his trouble. The psychiatrist, when asked about the case, said the man had a schizoid personality for which he had been giving treatment and which had existed for some time—even before the man went to work in this plant.

The company asked if this case should be considered an industrial injury. They also asked for a general statement concerning the clasification of accidents that occur as a primary result of a pre-existing mental illness.

The commitee agreed that this case should not be considered to be an injury arising out of and in the course of employment and therefore should not be included in the rates. The committee did not believe it could give a general rule to follow in all cases of pre-existing mental deficiencies but suggested that each case should be considered on its own merits.

CASE 84. On June 22, at 12:45 p.m. a steamfitter undertook to replace a worn gasket in a valve on a steam line leading from the top of a boiler which was in standby status. The valve leaked, permitting an accumulation of pressure at the valve. The employee attempted to remove the valve without bleeding the line. He cut seven of eight bolts from the valve bonnet, at which time the pressure blew the valve.

The man, apparently working to one side of the valve, was struck by some of the steam and hot water released by the blowout. This resulted in first and second degree burns of right wrist and forearm and right shoulder in several small patches about two inches in diameter.

The employee, working alone, had no recollection as to how he descended from the top of the boiler to the boiler room floor level, approximately fifteen feet. Later, an investigating committee deduced from marks on the boiler surface that he slid either on his posterior or stomach over the slope of the boiler and jumped the seven or eight remaining feet to the floor, and on striking the floor fell back on his hips.

He was removed in an ambulance to a hospital and was attended upon arrival by a doctor called by the company.

When the patient was admitted to the hospital and during his entire hospitalization, details concerning the accident were not available. Shortly after the patient was admitted to the hospital the safety director of the plant visited the Emergency Room where the patient was undergoing examination and treatment for burns. At that time all that was known of the accident was that the man had been working at the top of the boiler, that the pressure had blown the valve, and that the man was found in a dazed condition on the boiler room floor. The patient was unable to fill in the intervening details.

Because of this, the safety director, in conversation with the doctor, suggested that the man could be held in the hospital for a period not to exceed 48 hours for observation if a blow to the head or abdomen was suspected. He suggested that, in the absence of information as to whether or not the abdomen or head was involved, the safe course would be to take advantage of the provision. The doctor agreed and directed that the man be held in the hospital.

At the time of this conversation x-rays had not yet been taken.

Later, the doctor ordered x-rays of the pelvic region to determine if the man had suffered any fractures. The x-rays proved negative. The doctor's report to the company stated in part as follows:

> DIAGNOSIS: First and second degree burns of right wrist and forearm and right shoulder, small patches each about two inches in diameter; also behind right ear and of the left wrist. A contusion of the sacral area upper half with some swelling and tenderness.
>
> X-RAY REPORT: X-ray of lumbar sacral area including pelvis revealed no recent demonstrable bony pathology. There is some evidence of old chronic arthritis and also evidence of lumbo sacral congenital abnormality. No evidence of pathology due to recent injury.

On June 24, at 10:30 a.m., the patient was released from the hospital, after the doctor had advised him that his injuries were not serious and he could report back to the company for work.

Instead of doing this he went to his family physician who sent him to another hospital for examination and x-rays. He was discharged from the second hospitalization on June 26. The family doctor found no medical facts different from those determined in the first examination. Nevertheless, the man continued to remain away from work, after notifying the company that he wanted to rest his back for two or three weeks.

The company supplied the following statement from the physician who attended the patient:

> "We wish to state that the injuries sustained by this man on June 22, 1949 were not sufficient to prevent him from returning to work on the shift following the injury."

Attention was also called to the fact that the next shift occurred on the day following the injury.

The following is a quotation from the letter written by the safety director of the company:

> "In view of the absence of witnesses and the man's inability to supply information regarding the accident, the only safe course seemed to be to hold him under observation.
>
> "There is no doubt in anyone's mind but what the man struck both his head and abdomen in his descent from the top of the boiler to the floor. Whether or not damage resulted from such contact was, at the time the decision was made to hold the man for observation, a moot question."

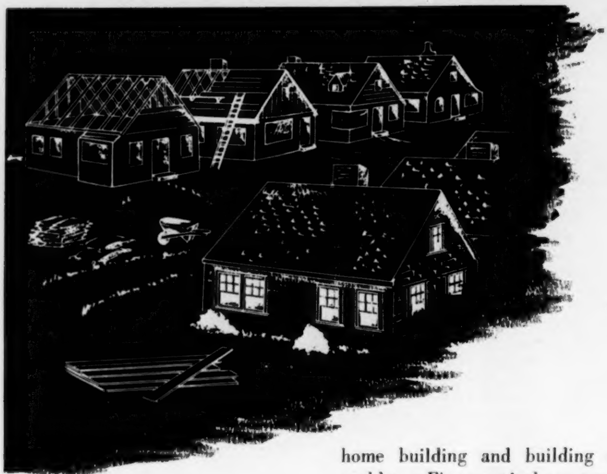
The question for interpretation was this: When an injury occurs under circumstances which make it seem likely, or at least possible, that injury to the head and abdomen have occurred, although definite facts that such injury has occurred are lacking because of the failure of the memory of the victim, does the clause pertaining to "hospitalization for observation" in the code apply?

The committee agreed that this case should not be included in the industrial injury rates.

One of the members in commenting on this case, stated that his vote was on the basis that the entire purpose of the hospitalization was for observation, as specified in 3.4.3 of the code and not for treatment of the injuries. He suggested that whenever this applied, a statement should be made a part of the case record that the time spent in the hospital was for observation, and that this entry should be made in the record at the time of admittance to the hospital rather than at some later date.

LESS WASTE =

Building groups ask National Pr[...] on standards to conserve materi[...]



DIMENSIONAL coordination and the American Standard 4-in. module for building materials and equipment have been given high rating as a means of cutting building costs and reducing waste of materials.

A round table of the home building industry which met in January under the auspices of the *Magazine of Building*, estimates that savings and economies due to the use of dimensional coordination might reach as much as a billion dollars a year in home building alone. Motivating the conference was the general principle that "the only alternative to a drastic reduction in the American standard of living is a still more drastic reduction in the American standard of waste." As one of the means for an all-out attack on waste the round table recommended that all projects paid for by the Federal Government be planned for dimensionally coordinated materials, and that scarce materials be withheld from projects not designed to take advantage of the savings made possible by dimensional coordination. (See "What the Round Table Recommended," on page 121.)

Top experts in various aspects of home building attended the conference. They included the president of the American Institute of Architects and two architects selected by him for their special familiarity with home building and building code problems. Five practical construction experts nominated by the National Association of Home Builders, including the chairman of the Prefabricated Home Manufacturers Institute, were present. Top building research men from some of the best technical schools, as well as some of the principal material-producing industries, also took part. The American Standards Association was represented by Howard Coonley, ASA past president, and H. M. Lawrence, materials engineer. The ASA A62 project on Dimensional Coordination was represented by M. Edward Green, chairman of the A62 committee.

Dimensional coordination was not by any means the only method recommended to cut waste in building homes. By far the greater part of the savings that could be made "are blocked by senseless requirements imposed upon the home building industry by obsolete local building codes, union rules, mortgage requirements, and other regulations," the report of the conference declares.

If all such obstructions were removed, the savings could reach as much as 30 percent or even 40 percent of the present cost of building, it was agreed. "Sacrificing nothing but waste," the report declares, "it should still be possible to build a *better* house with 50 percent less cast iron pipe, 50 percent less cement, far less lumber, far less gypsum, far less steel. It should be possible to build just as good a house with 75 percent less copper. In other words, an all-out attack on waste could save more critical materials and more critical manpower than could be saved by a drastic further cut in housing starts."

Many of the important recommendations called on standards to help in effecting this saving.

"Because copper and aluminum are the most critical of all commonly used critical materials, it is particularly important to minimize waste in electrical installations," the round table decided. "Out of 766 local codes, there are still 541 which compel home builders to install more costly and elaborate wiring systems than are prescribed by the national electrical code," they declared.

As one recommendation to save critical materials the round table proposed that the National Production Authority should not allocate metals for use in any wiring system in excess of the requirements of the National Electrical Code.

Since the electrical requirements of the great majority of houses are very similar, the National Production Authority should invite committees of the American Institute of Architects and the National Association of Home Builders that are collaborating on architect and builder cooperation to draw up standardization requirements, the conference recommended. NPA should also ask the Building Research Advisory Board of the National Research Council for an immediate recommendation for the most economical use of metals in such standardized installations.

With plumbing requiring many of the most critical materials, the NPA should insist that no critical plumbing materials whatsoever should be allocated for construction in communities which impose plumbing requirements in excess of the minima set forth

MORE HOMES

oduction Authority for action
als and cut construction costs

in the new National Plumbing Code now nearly completed. Organizations concerned are being canvassed by the sponsors of the American Standard Plumbing Code, A40.7-1949, before submitting the new standard to the American Standards Association for approval in place of the 1949 edition.

General adoption of the minimum standards approved by this new code would make possible great savings of materials by permitting hitherto impossible mass production economies due to nationwide standardization, the round table report declares. Specifically, it states: "It would save as much as two-thirds of the cast iron required for drainage inside a small house by reducing the required diameter of the stack from 4 in. to 3 in. and eliminating the requirement for extra heavy pipe. It would save all the cast iron usually required for drainage outside the house by accepting nonmetallic pipe. It would eliminate the necessity of a house trap which now adds from $40 to $75 to the cost of many small houses, although as far back as 1925 the Hoover Plumbing Code declared it unnecessary, and many cities now forbid its use. It would reduce the height of the stack above the roof to 2 in. Its approval of stack venting and wet venting would eliminate the great cost of individual back vents."

The American Institute of Architects-National Association of Home Builders' committees on architect and builder cooperation are urged by the conference to agree immediately on a dimensional standard for the spacing of bathroom assemblies which will permit standardized, mass-produced assemblies for all houses with the bath backed up against the kitchen, or with two baths back to back. At present, bathroom arrangements are almost standardized without achieving the benefits of standardization, it is stated.

Savings might be effected if ceiling and sill heights could be formally standardized, it was agreed. The trend at present is toward ceiling heights around 8 ft, living room sill heights around 32 in., and bath and kitchen sill heights around 42 in. Agreement on these standards would make it possible to ask producers of lumber, wall board, and other materials to supply materials in sizes precut to fit. It was recalled that builders of the industry-engineered house, constructed as an experiment several years ago, had to choose between sawing ends off all their lumber if the ceiling height conformed to wall board sizes or sawing ends off all their wall board if the height and width of rooms conformed to lumber lengths.

To take advantage of all possible standardization benefits, the AIA-NAHB committees were urged to make an immediate and careful study to determine where standardization could permit substantial economies without sacrificing the freedom needed for good design. The round table recommends that when these committees have reported, AIA, NAHB, and the Producers' Council should ask suppliers to make materials available to fit these standards without waste. Quick action is recommended.

"Practically every small house in America is structurally over-designed," the report declares. "This is partly because various codes require the structure to meet such unrealistic standards as a 40-lb live

(Continued on page 125)

What the Round Table Recommended

Reprinted from "Magazine of Building," February 1951

The 4-in. module sponsored by the AIA and the Producers' Council and approved by the American Standards Association offers savings and economies very conservatively estimated at 5 percent to 10 percent of the total cost of construction—perhaps a billion dollars a year on home building alone and perhaps two billion dollars a year in the entire construction industry. There is unanimous agreement throughout the industry that dimensional coordination would save countless hours fitting materials together and save great quantities of material now cut off and wasted in fitting. It would also permit impressive quantity production and warehousing economies which are impossible without such standardization of sizes.

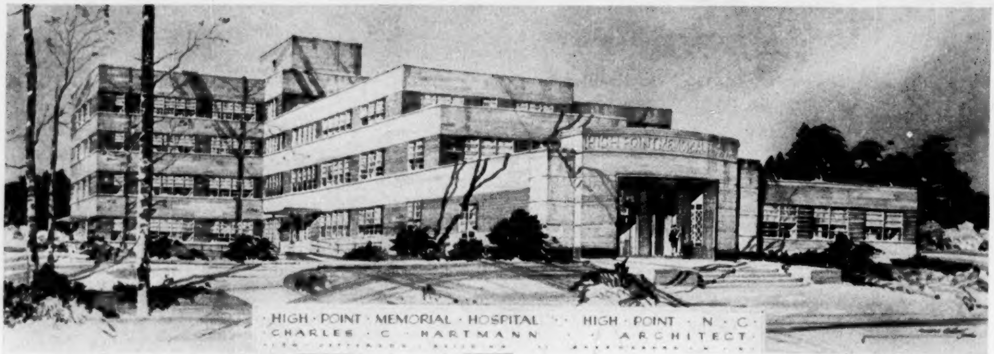
Unfortunately, under normal conditions it might take many, many years to bring dimensional coordination into general use. And its full benefits cannot be realized as long as some architects, some builders, some suppliers, some cities and some Federal construction agencies delay its adoption, thereby compelling producers to continue the present multiplicity of sizes.

Recommendations: 1. We recommend that NPA issue orders that all projects to be paid for by the Federal Government must be planned for dimensionally coordinated materials.

2. We recommend NPA withhold scarce materials from projects designed after April 1, 1951, which are not designed to take advantage of the savings made possible by dimensional coordination.

3. We recommend that NAHB call upon all its members to ask their architects on all projects designed after April 1, 1951, to design them to dimensional coordination.

It is our belief and hope that such a concentrated attack on the wastes inevitable without dimensional coordination can achieve, within a few months, progress towards economy in materials and manpower which might otherwise have to wait a generation.



How Modular Coordination Works

by William Demarest, Jr

WHEN an automobile is assembled, there are no broken-off or sawed-in-half pieces left over afterward. Wherever you see a building going up, however, you also see a small mountain of waste material piling up beside it.

This trash-heap of brand-new materials waiting to be thrown away is a part of the cost of a building, although it represents nothing but inefficiency and waste. These scraps cost just as much to buy as the material which remained in the building. Many manhours of labor went into delivering them to the site as part of the materials for the building, then cutting them off and throwing them away.

Although the different parts that went into the automobile may have been manufactured in a dozen different states, each was made the right size so that they would fit together, exactly, on the assembly line. Building materials, on the other hand, have from time immemorial been made in any old size, generally following custom or the convenience of the manufacturer, but with little or no attention paid to how they would fit together in a building. The architect knew that no matter how carefully he adjusted the dimensions of his building, most of his materials would not quite fit. He let every dimension stand, just as it happened to work out, and relied upon the contractor to cut the materials to fit and squeeze them into arbitrary dimensions on the blueprints.

The system designed to do away with such extravagance is called Modular Coordination. It is a system of dimensioning—a logical method for fitting standard-size building materials together without the need for "custom-tailoring" them on the site.

Mr Demarest, secretary of the Sectional Committee on Dimensional Coordination of Building Materials and Equipment, A62, has his headquarters in the offices of the American Institute of Architects, Washington, D. C. He is secretary for Modular Coordination of the AIA, charged with the task of bringing about a better understanding of modular coordination among architects, contractors, and building materials producers. Up to the present time, his activities have been mostly among architects, although he disclaims any intention of answering the moot question—"Which comes first, the architect's drawing calling for modular sizes, or the building materials and equipment produced in modular sizes?"

At its meeting February 16, the A62 committee voted to continue its support of this promotional program, and to work toward adding a technical expert to help the study committees. Technical help is needed, it was explained, in order to work out detailed dimensions for each type of material and each piece of equipment, and to coordinate them all so they will fit together automatically.

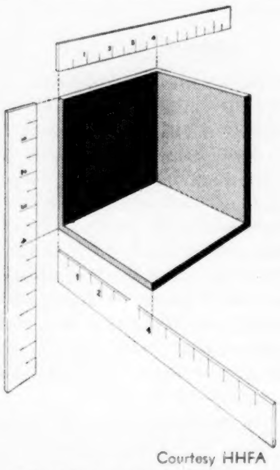
Its title, "Modular," gives a clue to how it works. Following years of study by men representing practically the entire building industry, a module was agreed upon, to serve as guide to the architect in setting the dimensions of each building he designs and to the manufacturer in fixing the sizes of his products—bricks, windows, and so on. Since a building is a 3-dimensional proposition, the module is 3-dimensional. It is a cube, one-third of a foot high, one-third wide, and one-third deep.

Modular Coordination works like this: The architect designs his building in Modules—the little Modular cubes—as if he were putting together imaginary toy alphabet blocks. A third of a foot is four inches exactly, with no small fractions of an inch. The architect would no longer decide to make the front wall for a building say, 24 feet, 7⅞ inches wide. It would be so many Modules wide. It would also be a certain number of Modules high, and perhaps 2, 3, or 4 Modules thick, depending on the construction. A window-opening in it might be, say, 12 Modules wide and 16 Modules high.

Thus the architect designs by arranging Modular cubes. At the same time, the manufacturer standardizes the sizes of his products by the same Modular cubes. As a simple ex-

ample, one size of Modular brick that is manufactured today is just right to occupy two of these imaginary cubes, side by side: 8 inches by 4 inches by 4 inches. A window will be just the width and height to occupy so many Modules; and so on, with doors, bathtubs, and all the million-and-one other parts that will be assembled to make a building.

The contractor's job becomes a great deal simpler. Comparatively speaking, everything drops into place. The front wall of the building just mentioned, for example, might be something like this, starting from one side and working toward the opposite end: So many Modules of brick and then a window-opening a certain number of Modules wide. Again, so many more Modules of brick and then perhaps an opening for the front door in the center. Each brick is just two Modules long, so it is easy for the bricklayer to start and also stop the brickwork exactly where the architect intended. The bricks will not have to be squeezed together and he will not have to saw an inch or two off the bricks at the end. A window



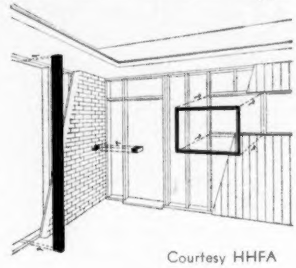
Courtesy HHFA

The Module Is 3-Dimensional

the same number of Modules wide as the window-opening will have been ordered and delivered to the job. It only has to be placed in the opening and it will fit snugly, because it was *made* to fit an opening just that width. Again, the door will come just the right number of Modules wide and will fit into the brick wall easily.

It is as simple as that. Design the building by Modules and you can be sure that Modular-size products will fit into it efficiently.

In the case of those Modular bricks just used for an example, if each takes up two Modules, what has become of the mortar joint? The brick occupies two Modular cubes, but it does not fill them. Suppose



Courtesy HHFA

Everything Fits into Place

the mortar joint is half an inch. The actual dimensions of this size Modular brick, as manufactured today, are $7\frac{1}{2}$ by $3\frac{1}{2}$ by $3\frac{1}{2}$ in. Each unit, when the joint is included, fills the Module. (And to fit snugly into that brick wall, the Modular window has an extra $\frac{1}{2}$-inch width.) This was all studied out before the manufacturers went into the production of Modular sizes. In every case, the size of the joint has already been taken into account.

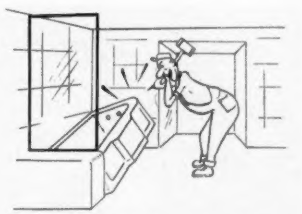
This method is more than just a good idea. It is already being used by many architects, all over the country. At Idlewild Airport in New York, the new airplane hangars that have been going up are Modular. The University of Illinois recently completed a group of 30 Modular houses for families of faculty members. In Houston, the enormous National Biscuit bakery is a Modular building. There are office buildings, hospitals, and also schools in many states which are Modular, as are more and more of the new structures that have been put up since the War.

Examples of Use

In Syracuse, New York, the architects for a state housing project wanted proof as to whether the project would cost less if it were Modular than it would if it were put together in the old, haphazard way. After the design was settled upon, they drew up two sets of blueprints, one Modular and one non-Modular. They sent a set of each to every contractor who was to bid on the job and asked for pairs of bids on the project, one if it were Modular and one if it were non-Modular. Every contractor put in a lower bid on building it by Modular Coordination. The successful bidder's price to do it Modular was $8,000 less than to do it the old way.

The town of High Point, North Carolina, has opened a big, new hospital built by Modular Coordination. The man in the contractor's office who was responsible for the High Point Hospital said it was his first experience with Modular Coordination. "Modular Coordination can't be recommended too highly," he said. "It simplified things beyond belief."

The architects who designed the High Point Hospital have used nothing but Modular Coordination for several years now. They have done a variety of jobs using this system: a bank, a department store, a block of specialty shops, an office building, a number of houses, and



The Old, Haphazard Way

currently a 4 1/3 million-dollar apartment project—all Modular. It is their opinion that it is the architect's professional duty to look out for his client and that he has no right to pass along to his client the added cost of building the old, non-Modular way.

In South Royalton, Vermont, a new high school has been built by Modular Coordination. The archi-

(*Continued on page* 125)

A62 Committee Maps *Active* Program

THE February 16 meeting of Sectional Committee A62 on Dimensional Coordination of Building Materials and Equipment was held in an atmosphere of intensified interest in use of modular standards. Not only was it soon after the round table on home building (reported on page 120) but it was on the very day on which a second round table was being held—this time on conservation in heavy construction. The committee discussed the need for its program under present conditions of material shortages.

Howard Coonley, Conservation Consultant to the National Security Resources Board, was the speaker at a buffet lunch in the meeting rooms of the American Standards Association between the morning and afternoon sessions. He reported that the National Production Authority is setting up a Conservation Section in each of its divisions, and that a general Conservation Coordinating Committee is being organized.

That committee will be made up of representatives of 16 of the government agencies who have a major interest in material, production, and manpower. There will be representatives from the Munitions Board and all the three Departments of Defense—War, Navy, and Air Force. There will also be representation from NPA, and from the Housing and Home Finance Agency. One of its first jobs, Mr Coonley declared, will be conservation in the construction industry.

"We are in for a long, hard pull," Mr Coonley said. "We are going to be shorter of materials than we were in World War II. You are going to have to use more ingenuity in cutting down your cost, finding better methods to do what you are doing today, and in finding substitution of materials."

"The building industry can make its contribution to the nation's conservation program by pushing ahead on the use of modular coordination," he declared. "The savings in materials, in manpower, and in time that the use of this method makes possible will be a substantial step forward. It will not only help to save materials but will make it possible for the construction industry to do more building with those materials that are available."

The committee's work was described by M. Edwin Green, Lawrie and Green, Harrisburg, Pa., chairman of Committee A62; Theodore I. Coe, Technical Secretary of the American Institute of Architects, and Harry C. Plummer, Director of Engineering and Research of the Structural Clay Products Institute.

Mr Coe mentioned that almost all concrete block and glazed tile made in this country are modular; so are most of the stock wood windows and glass block; and metal windows and brick are widely available in modular sizes.

Stating that modular coordination is already being used effectively, Mr Plummer cited examples of savings from use of this system. "The state housing project at Syracuse, N. Y., saved $8,000 from the use of modular sizes," he said.

Subcommittee Reports

Subcommittees now working to adapt the modular unit to sizes of materials and equipment in their industries reported on masonry made of structural clay products; wood doors and windows; masonry made of concrete; metal windows; natural stones; structural wood; building layout; structural steel; miscellaneous metal products; cast-in-place concrete; window accessories; glass block; metal doors; cast stone; kitchen equipment; and toilet partitions and shower stalls.

New standards for coordinated dimensions of kitchen equipment and of toilet partitions and stalls have been completed in preliminary form.

Industries representing a wide variety of kitchen equipment—ranges, refrigerators, sinks, laundry equipment, wood and metal cupboards—have reached agreement on these preliminary standards. It is expected that they will be cleared for final approval very soon.

ACME Newspicture

Alan C. Bemis (left) chatted with M. Edwin Green, A62 chairman, at committee meeting. Albert Farwell Bemis, Alan's father, pioneered the modular work.

The Standard dimensions for toilet and shower stall partitions, both metal and stone, have been sent out for comment by groups concerned with other related materials and equipment. The standard dimensions have already been coordinated with the natural stone, glass, and metal industries, D. G. Hann, Sanymetal Products Company, chairman of this group, declared.

Details showing how modular sizes of wood windows fit together with other products, particularly masonry, have been worked out. B. J. Triller, Farley and Foetscher Manufacturing Company, chairman of this group, reported that they have been submitted to committees handling other equipment and materials for criticisms and suggestions. Many manufacturers of wood windows are keeping their production entirely to modular sizes, Mr Triller said. A Commercial Standard, adopted by the industry and promulgated by the U. S. Department of Commerce, follows the modular layout with one exception. However, it remains for manufacturers of window frames to provide the modular frame called for by the standard.

The metal window industry also has adopted modular sizes for all types of windows with the exception of residential casements. Before adoption of the system, 30,000 types of windows were catalogued for sale by the industry, W. C. Randall, chief engineer, Detroit Steel Products Company, declared. Now there are about 500 or 600. Application details are now being worked out between the window industry and other industries, such as brick, in order that all will fit together in construction.

Coordination of Masonry Sizes

An American Standard basis for the coordination of masonry sizes is already set up and is being used in cooperation with architects. In Detroit and Chicago nonstandard sizes carry a premium, E. W. Dienhart, executive secretary of the National Concrete Masonry Association, reported. Mr Dienhart is chairman of the Study Committee on Masonry Made of Concrete of Committee A62. There are still many details to be worked out in the relationships between masonry products and other products such as brick, he pointed out.

Committee on Natural Stones

The Study Committee on Natural Stones, including granite, limestone and marble, is waiting for the development of standards by other groups before proceeding with its own sizes, F. J. Plimpton, Manager, Vermont Marble Company, and chairman of this study committee, declared. This is because natural stone can be cut to any reasonable size. The committee is reviewing other standards, however, and making suggestions for changes when it sees problems developing. A gooseneck design for a sill that would have been difficult and costly to manufacture was eliminated in this way.

A subcommittee has been set up to work on standard dimensions for interior marble, slate, granite, and other materials, in addition to one on exterior natural stones.

Instructions to Workmen on the Job

Because cast-in-place concrete is completely flexible material, the greatest concern of the Study Committee on this subject is in carrying modular instructions to workmen on the job, J. J. Hogan, Portland Cement Association, reported. This calls for a clear indication on working drawings to show dimensional placement of forms with proper tolerances for placement of various materials. A Study Committee on Building Layout has been asked to draw up instructions, trade by trade, that can be passed to the shop drawing level to illustrate the meaning of dimensional indications. This same committee is reviewing standards for products and equipment as they are completed by the Study Committee to be sure the dimensions are coordinated.

Modular Coordination

(*Continued from page* 123)

tects, Whittier & Goodrich, report that where workmen were laying 300 units of masonry per day the old way, on this job they would lay 500 a day. Mr Whittier says, "We can produce at good speed with a small force when we work with a layout of this type. Details automatically take care of themselves."

In Canton, Ohio, a masonry superintendent on the new Wells School, which is Modular, said he would rather do a Modular job than any other type. More significant, he said that Modular Coordination is a money-saver. This was corroborated by the architects, Lawrence and Dykes, who have done several Modular schools. Mr Dykes said: "I am convinced that it saves construction costs. It saves time, and therefore, money."

Less Waste, More Homes

(*Continued from page* 121)

load on the floors, a 20 to 30-lb wind load, and a 30-lb snow load (5 ft of wet snow in the places where even 2 ft of wet snow has never been seen). It is partly because too little thought and study has been given to more economical engineering of the structure." The loads mentioned here are in general those given in the American Standard Minimum Design Loads on Buildings and other Structures, A58.1-1945.

On this point the conference recommended that the Federal Government should make funds available for studies of possible structural re-engineering of the small house for greater economy of manpower and materials. The studies should also include coordination of existing research to establish more realistic standards—which can vary from region to region to meet differing climatic problems. As soon as such studies are completed NPA, NAHB, AIA, and the National Retail Lumber Dealers' Association should collaborate to bring new, less wasteful structural standards into general use.

Standards From Other Countries

MEMBERS of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. The titles of the standards are given here in English, but the documents themselves are in the language of the country from which they were received.

For the convenience of our readers, the standards are listed under their general UDC classifications.

332.1 Banking

FRANCE — NF

Code of Abbreviations for the Names of Banks and Certain Financial Establishments — K 10-12
Forms for Small Check-Books — K 11-02

621.13 Steam Locomotives

RUMANIA — STAS

Smoke Tubes for Locomotive Boilers: Copper, Steel — 1015-1019

621.25 Hydraulic Pressure Machinery

GERMANY — DIN

Air and Draining Valves for Waterlines for Nominal Pressure from 100 to 630 — 2814

621.28 Surfaces

GERMANY — DIN

Surface Finishes. General, Representation and Definitions. Reference System. Dimensions — 4760/1/2

621.3 Electrical Enginering

AUSTRALIA — AS

Instrument Transformers — C 45-1950
PVC—Insulated and/or Sheathed Cables, Flexible Cables, and Flexible Cords — C 147-1950

FRANCE — NF

Rules for Construction and Maintenance Electric Connecting Lines Between the Main Power Line and the Inside Wiring System — C 48

GERMANY — DIN

Four Types of Coil Cores Used in Telecommunication — 41288
General Conditions for Telephone Communication — 44010
Shaft Ends of Electric Polishing Machines — 44500/1/2
Set Screw, Metric Thread, for Brushholders — 46291
Pattern for Roughening Cemented Part of Insulators and Bushings — 48108
Steel-Aluminum Cable for Overhead Power Lines — 48204
Transformers for the Installation in Mines — 42526
Transformers. Bushing Insulators for Indoor and Outdoor Installations, from 1 kv to 45 kv and from 200 amp to 3000 amp — 42530 thru 42534 and 42539
Transformers. Bushing Insulators for Outdoor Installation 60 and 110 kv, 200 and 600 amp — 42535
Water Cooler of Transformer Oil — 42556
Brush-Holder Lever and Spring for Traction Motors — 43054, B1.3, 4
Studs and Octagon Castle Nuts for Traction Motor — 43228
Insulating Tubes and Bolts for Indoor Installation — 48107, B1.1
Ceramic Insulating Pieces — 40680
Lead Storage Batteries' Plates — 40730
Telecommunication. Magnet Core — 41286
Rectifiers, Dry Type — 41760
Outside Transformers, Single Phase, 16⅔ Hz, 6500 kva — 42529, B1.1
Cartridge Fuses, 500 v — 43620, B1.3
Electric Meters — 43850
Name Plate for Electric Meters — 43855, B1.1
Terminal Clamps — 46290
Ceramic Insulators Series 60 and 110, for Outside — 48109, B1.1, 2
Ceramic Insulators Series 110, 150 and 220, for Outside — 48110, B1.1
Ceramic Insulators, Series 60 and 110, for Inside — 48134, B1.1, 2
Different Types of Lightning Conductor Ferrules — 48805, 48808, 48860
List of VDE Rules, Revised — 57000

NEW ZEALAND — NZSS

Thermal Storage Electric Water Heater — 720

RUMANIA — STAS

Gage for Lamp Sockets — 1340
Storage Batteries with Lead Plates — 446
Insulated Armored Conduits. General — 544
Insulated Armored Conduits. Details — 556/7/8/9
Insulated Armored Conduits. Fittings — 550/1/2
Electric Dry Cells and Batteries — 808/9

621.64 Devices for Conveyance and Storage of Gases and Liquids in General

AUSTRALIA — AS

High Carbon Steel Cylinders for the Storage and Transport of High Pressure Liquefiable Gases — B 11-1950
Electric-Resistance Welded Steel Tubes — B 102-1950
Mild Steel Drums for Liquids — K 87-1950

RUMANIA — STAS

Gas Cocks, General — 1055
Seamless Steel Pipes — 875
Gate Valves for Nominal Pressure of 25 kg/sq cm — 1054
Mechanical and Technological Tests of Steel Pipes — 1111
Wedge Valves for Nominal Pressure of 25 kg/sq cm — 1147
Flanges, Cast Iron and Steel. Classification — 1155
Cast Iron and Steel Wedge Valves. General — 1180

621.75 Tools and Machinery Manufacture, Fitting, Assembling

GERMANY — DIN

Gages for testing Snap Gages from 1 to 315 mm — 2253
Table showing all types of Snap—, Plug,—Ring—etc Gages and their description — 2259

POLAND — PN

Set of Surface Testing Blocks — M-53107

RUMANIA — STAS

Gages for Tool Squares — 583
Ring Gage for Edison Screw — 1341

621.774 Pipe Manufacture

ARGENTINA — IRAM

Seamless Tubes, Cold-Drawn, for Bicycles — 2519

FRANCE — NF

Cast Iron Pipe Fittings and Parts — A 38-011

621.791 Soldering Welding Cutting

BELGIUM — NBN

Oxy-Acetylene and Similar Welding Apparatus — 228-1950

FRANCE — NF

Materials for Arc-Welding — A 85-011
Method of Taking Reading of Static Characteristics — A 85-020
Heating Test — A 85-021
Weldability Test — A 85-023
Commutation Test — A 85-024
Efficiency Test — A 85-025
Classification of Automatic Welding Machines — A 85-410
Testing of Electric Arc Welds — A 85-022

GERMANY — DIN

Arc-Welding Machines — 44761

NEW ZEALAND — NZSS

Resistance Welding Equipment — W 55.1-1950

RUMANIA — STAS

Welding Electrodes and Wires — 1125/6

SWITZERLAND — VSM

Rules for the Preparation of Steel Pieces to be Welded — 14031 a
Different Types of Welds — 14032 a
Filler Metal — 14044

621.8 Machine Parts. Hoisting and Conveying Machinery. Power Transmission. Means of Attachment. Lubrication

FRANCE — NF

Lock Washers, Teeth Type — E 27-618

GERMANY — DIN

Square, Gib-head and Tapered Keys — 143, 491
Set Screws, Different Types — 427, 438, 551, 561, 564
Hexagon Nuts Sizes M5 to M100 — 555, B1.1
Screw Thread Plug Gage — 2292

Straight Sided Splines, Shafts and Hubs	5464
Involute Splines, Shafts and Hubs	5482, B1.1

622.2 Mining Processes and Methods of Working

GERMANY	DIN
Sheave for Flat Cable	21151
Guide Sliding Carriage	21164
Plumb	21198
Drill Head for Stone	20394
Sealing Boxes for Mining Cables	22421

622.3 Special Kind of Mining

RUMANIA	STAS
Oil Drilling Tools. Special Coupling	325
Oil Drill Head with Three Blades	408
Oil Drilling Tools. Hydraulic Cap	439
Oil Drilling Tools. Protective Device	591
Oil Drilling Tools. Round Nozzles	694
Oil Field Equipment Drill Rods	323
Oil Field Equipment Taper Gages for Drill-Rod and Special Threads	834/5
Oil Drilling Tools. Paraffine Scrapper	774/5
Oil Drilling Equipment. Pipe Flanges, 70 atm	874
Special Wrench for Oil Well Pumps	1259

624 Civil Engineering

FRANCE	NF
Wooden Frames, Joinery, etc	P 23-402
GERMANY	
Hanging Wire-reinforced Plaster Ceiling	4121
Furniture Layout in Dwellings	18011

624.13 Earthwork

SPAIN	UNE
Determination of Soil Shrinkage	7016

625.1 Railways and Tramways

FRANCE	NF
Rail-lifting Jack, 5-ton	F 76-029
Wash Basins, Toilet Bowls, etc. for the Installation in Railway Cars	F 01-036 thru-038
Buffers, Plunger Type	F 10-005
Reinforced Concrete Conduit for Fixed Electric Lines. Different Designs, Parts, Ferrules, etc	F 55-034 thru-043
GERMANY	**DIN**
Rail and Sleepers Sections for 600 mm gage Track with Rails up to 20 kg/m	5908
RUMANIA	**STAS**
Different Narrow Railroad Gages	879
SPAIN	**UNE**
Wooden Sleepers	25002
Wheel Rims	25019

625.7 Road Construction

RUMANIA	STAS
Concrete for Road Building	183
Natural Sand for Road Building	662
Quarry Stones for Road Building	730
Road Building. Surface Finishing	787
Macadam Partly Impregnated with Bitumen	1120
Road Covering with Hot Asphaltum	1121

662.6 Heat Industry in General Natural Fuel

AUSTRALIA	AS
Sampling and Analysis of Coal and Coke	CK. 2, Parts II & III
FRANCE	**NF**
Determination of Volatile Matters in Solid Mineral Fuels	M 03-004
Classification of Soft Coals, Anthracites and Their Mixtures	M 10-001

662.9 Heating Apparatus and Methods

AUSTRIA	ONORM
Testing of Gas Ovens and Stoves	M 7414
NEW ZEALAND	**NZSS**
List of Standard Sizes for Cast Iron Radiators	B 79-1950
RUMANIA	**STAS**
Regulating Valves for Central Heating	532/3
Nipple for Radiator	1300

629.12 Ships and Shipbuilding

FRANCE	NF
Sanitary Faucets for Ship Wash Basins	J 35-550
Bathtub and Shower Faucets on Shipboard	J 35-552/3
Union Joint for Flush Faucets	J 35-555
Spring Door Catch	J 36-273

661 Chemical Products

RUMANIA	STAS
Ammonium Sulfate, Technical	931
Chloride of Lime	932
Ammonia Liquor	934
Salicylic Acid	935
Cellulose Sulfite Bleached I.a	928
Cellulose Sulfite Unbeached I.b	929
Cellulose Sulfite II-a	940
Cellulose Sulfate II-a	979
Sodium Pyrosulfate, Technical	992
Sodium Acetate	993
Potassium Arsenite, Technical	994
Bicarbonate of Soda	1050
Ammonium Nitrate	1072
Calcium Carbonate, Precipitated	1083
Silver Nitrate	1084
Sodium Carbonate, Anhydrous	1200
Silver Nitrate Pure	1325
Napftalene	1278
Sulfate of Magnesium	1274
Ammonium Carbonate	1277

665 Vegetable Oils, Fats, and Waxes

ARGENTINA	IRAM
Vegetable Oils—Determination of Color	5503
Vegetable Oils—Determination of Loss in Weight by Heating	5510
Vegetable Oils—Determination of Free Acidity	5512
Vegetable Oils—Determination of Saponification Number	5516
FRANCE	**NF**
Colza Oil, Refined	V 57-001
THE NETHERLANDS	**N**
Fatty Seeds. Determination of Moisture, Fat and Free Fatty Acids	1605
RUMANIA	**STAS**
Oleum Ricini, Sulfonate 40 percent	1407

666 Glass and Ceramic Industry

CHILE	INDITECNOR
Packing and Sampling of Cement	2.30-60
Asbesto-Cement Slabs	2.30-162
Asbesto-Cement Pipes and Fittings for Liquids and Gases Not Under the Pressure	2.30-167
Asbesto-Cement Pipes for Liquids and Gases Under Pressure	2.30-168
Sampling and Testing Asbesto-Cement Products	2.30-169
Low-Pressure Asbesto-Cement Pipes for Liquids and Gases	2.30-170
FRANCE	**NF**
Chemical Analysis of Refractory Products	B 49-442
GERMANY	**DIN**
Bottle for Edible Oils	6087
POLAND	**PN**
Dutch Titles	B-520
RUMANIA	**STAS**
Trass Cement	1118/9
Raw Material for Mosaic Flooring	1134
Cement Paving Tiles	1137
Glass Fount for Kerosine Lamps	1138
Cement Curb Blocks	1139
Cement Plates Type "Stabilit"	1239
Sheet Glass	853
Clay, Granulometric Analysis	1024
Glass Chimneys for Storm Lanterns	1025
Refractory Magnesium Products, Chemical Analysis	1027

669 Metallurgy

ARGENTINA	IRAM
Zinc-coated Steel Wire	562
Nickel	567
Nickel Bars	568
Copper-Nickel-Zinc Alloys Sheets and Strips	571
Method of Chemical Analysis of Ferrovanadium	592
Method of Chemical Analysis of Ferromolybdenum	594
FRANCE	**NF**
Physical Tests of Metals. Measurement of Grain Size	A 04-102
Non-Ferrous Metals. Hot-Rolled Round Bars	A 65-101
Non-Ferrous Metals. Hot-Rolled Square Bars	A 65-111
Aluminum and Aluminum Alloys. Hot-Rolled Hexagon Bars	A 65-112
Aluminum and Aluminum Alloys. Hot-Rolled Plates	A 65-113
Aluminum and Aluminum Alloys. Hot-Rolled Angles	A 65-151
Aluminum and Aluminum Alloys. Hot-Rolled Channels	A 65-161
Aluminum and Aluminum Alloys. Hot-Rolled I Section	A 65-162
Aluminum and Aluminum Alloys. Hot-Rolled Tees	A 65-163
Non-Ferrous Metals. Cold-Rolled Round Bars	A 66-101
Non-Ferrous Metals. Cold-Rolled Square Bars	A 66-111

Non-Ferrous Metals. Cold-Rolled Hexagon Bars	A 66-112
Copper, Brass, Aluminum and Aluminum Alloy Cold-Rolled Plates	A 66-131
Copper and Brass. Cold-Rolled Angles	A 66-151
Copper and Brass. Cold-Rolled Channels	A 66-161
Copper and Brass. Cold-Rolled Tees	A 66-163
GERMANY	**DIN**
Aluminum Alloys	1725, Bl.1
POLAND	**PN**
Manganese Iron, Analysis of	H-04200
Manganese-Silicon Iron, Analysis of	H-04202
Chemical Analysis of Iron Alloys	H-04205
Phosphorous Steel for Hot-Pressed Nuts	H-84023
Rolled and Grooved Steel Strips for Springs	H-93206
Steel Forgings, Tolerances for Straightness	H-94302
RUMANIA	**STAS**
Steel Balls	1185
SWITZERLAND	**VSM**
Steel Alloys. Rules for Different Analyses	10700
Tension Test of Metals	10921
Brinell Hardness Test of Metals	10922
Rockwell Hardness Test	10923
Vickers Hardness Test of Metals	10924
Flexion Test	10925
Impact Test	10926
UNION OF SOUTH AFRICA	**SABS**
Specification for Semi-finished Rolled Carbon Steel Products for Re-rolling and Forging purposes	76-1949

674 Wood Industry

FRANCE	**NF**
Classification of Flooring of Maritime Pine Lumber	B 54-003
NEW ZEALAND	**NZSS**
Classification and Grading of "Pinus Radiata" (Insignus Pine) After Machining	631
POLAND	**PN**
Wooden Handles for Trowels	B-59043
Wooden Handle for Shoemaker's Awl	O-54006
Alder Lumber	D-96010
Wooden Handles for Hammer	B-59042
Wooden Handle for Shoemaker's Tool	O-54031
Rough Wooden Poles for Overhead Electric Lines	E-19001
Hardwood Materials for Parquet Floors	B-94002
Pine and Spruce Sawmill Lumber	B-96001
Classification of Pine Lumber	B-96000
RUMANIA	**STAS**
Bent-Wood Furniture	1124
Wooden Bucket for Cheese	1293
Basswood Fiber	849
Resinous Lumber	942
Lumber. Tension and Cleavage Tests	1037/8
Oak Logs, Posts and Beams	1039/0
Plywood Drums	1123

676 Paper and Carboard Industry

ARGENTINA	**IRAM**
Method of Test for Tensile Breaking Strength of Paper and Paper Products	3012
Method of Test for Capillary Ascension of Paper and Paper Products	3014
Method of Test for Absorption of Paper and Paper Products	3015
NEW ZEALAND	**NZSS**
Sizes for Cut and Packed Duplicating and Typewriting Paper	735
POLAND	**PN**
Pulp Wood of Different Species	D-95002/3/4/5
RUMANIA	**STAS**
Wrapping Paper, Type A	1144
Tissue Paper	1346
Wrapping Paper, Type 2 S	1344
Paper Bags, Type 2 S	1371
Library Index Cards	R 945
Impregnated Paper Lining for Insulating Conduits	938
Poster Paper	980
Asphalt Impregnated Pasteboard, Type CTB	1028

677 Textile Industry

GERMANY	**DIN**
Artificial Fibers	60800
Cord and Fabric used in Tire Manufacturing	7836
NEW ZEALAND	**NZSS**
Cotton Mops	792
POLAND	**PN**
Nomenclature of Spindle Parts	P-63810
Paper Cones for Weft Pirns	P-64000/1
Gages for Bobbins	P-64005
Hacklers	P-63400
Carding Comb, Angle-Shaped	P-63504
Two Types of Wire-Saws	P-63505/6
Two Types of Rings: Reducing and Grooved	P-63808/9
Bobbin Spindle	P-63813
Warp-and-Weft Spindles, Braked	P-63814
Thread Guides	P-63848
Paper Bobbin Cones, Impregnated and Non-impregnated	P-64003/4
Wooden Pirns	P-64070
Wooden Spool	P-64071
Round Spinning Can	P-64100
Shaft Staves for Cotton	P-64101
Shaft Staves for Wool	P-64108
RUMANIA	**STAS**
Different Grades for Cotton Fabrics for Clothing	1171
Different Woolen and Mixed Yarn	1209 thru 1212
Different Cotton Fabrics	1213/4/5
Cotton Fabric, Bleached and Unbleached	1172
Cotton, Woolen and Mixed Stockings and Socks	1086
Stockings, Socks of Cotton, Wool and Artificial Fiber	1085
SWITZERLAND	**VSM**
Cones for Weaving Machines	31905
Spools for Silk and Rayon	31910

679 Plastic Industry

GERMANY	**DIN**
Injection Moulding Machine for Plastics. Detail for Machine up to 125 cu cm capacity	16751
Nozzle for Plastic Sprayers	16752
Preparation of Test Pieces of Plastic Material	53451
Die-Stamping Press and Injecjection Moulds for Plastic Products-Tolerances	16749
Pressing Time for Moulded Plastics	53465
Rules for Preparing Test Pieces	53451

683 Hardware, Ironmongery

INDIA	**IS**
Door Bolts, Tower and Barrel Type, Mild Steel and Bronze	204
Butt Hinges	205
Tee and Strap Hinges	206
Gate and Shutter Hooks and Eyes	207
Door Handles	208
POLAND	**PN**
Window- and Door-Locking Bolts	B-2693

69 Building Industry and Trade

GERMANY	**DIN**
Specifications and Estimate for Alteration in Existing Buildings	277
BELGIUM	**NBN**
Modular System. Door Openings and Doors	227-1950

725 Civil and Industrial Architecture. Public Buildings. Business and Industrial Buildings

FRANCE	**NF**
Minimum Requirements for Layout of Passageways	D 83-101/2

742 Perspective Drawing

SPAIN	**UNE**
Oblique and Axonometric Perspective	1031

744 Technical Drawing

GERMANY	**DIN**
Relative Positions of Views and Conventional Sections	6
THE NETHERLANDS	**N**
Garden Drawings. Arrangement of Fieldwork and Plotting Drawings	456
RUMANIA	**STAS**
Dimensioning	1145
Technical Drawings. Title Blocks	953
URUGUAY	**UNIT**
Scales used in Technical Drawings	71-50

77 Photography. Cinematography

CANADA	**CSA**
Eleven Standards for Test Films for 16-mm and 35-mm Motion Picture Films, for Various Test Purposes	Z 7.1.6.3-1950 thru Z 7.1.6.13-1950
Sound Records and Scanning Area of Double Width Push-Pull Sound Prints (Normal and Offset Centerline Types)	Z 7.1.6.14-1950 thru Z 7.1.6.15-1950
Projection Room and Lenses for Motion Picture Theatres	Z 7.1.7.7-1950
Dimension for Theatre Projection Screens	Z 7.1.7.8-1950

The use of statistical quality control results in savings in foundry operations, four speakers told members of the Steel Founders' Society of America, at its Fifth Annual Technical and Operating Conference in November.

C. R. Burdick, superintendent of manufacturing quality control, Ford Motor Company, explained that chart control is used by his company in machining and processing, assembly, and sampling of incoming materials. He outlined the gains from use of these techniques as higher product quality; reduction of waste, "reworks" and rejects; quick identification of trouble spots; enhanced control over assembly operations; greater certainty about materials quality; efficient planning of inspection.

H. H. Johnson, metallurgist, National Malleable and Steel Castings Company, reported that statistical quality control techniques are being applied on an expanding scale to foundry practice. His own company uses three classes of charts to measure and record various operations in the foundry processes: (1) process control charts, (2) production measurement charts, and (3) precent defective charts.

The first group of charts consists of those made from the measurements taken during the process itself, such as chemical analyses, sand properties, mold hardness, core dimensions, amount of welding rod used per coupler, etc. The second class of measurements includes those made of the physical properties of the steel produced, measuring of casting dimensions, the fit of moving parts, and similar measurements. The third group of charts is regularly maintained to give a picture of any defective castings which may be produced. All such charts are posted at locations where they will receive the most attention from supervision concerned with the specific data.

While it is difficult to evaluate benefits of any one set of controls in precise terms of dollars and cents, Mr Johnson said, anything that can be done to increase uniformity of processing, to speed production through the shop, to reduce the amount of reheat treatment or reworking required, to lower scrap losses and produce high quality material will be reflected in lowered costs of production. Statistical quality control is proving the means to accomplish this saving, he said.

W. R. Punko, superintendent of metals, Wehr Steel Company, Milwaukee, said that control of the melting department and individual melters through application of charts has brought about an improved and controlled product consistently within the desired chemical ranges, with high physical properties. Production has been increased, with reduction in the consumption of electrode and power. Refractory life has been increased, with accompanying reduction of hours per ton. Without reservation, he said, Wehr experience is that "without the charts, the graphical pictures, the statistical averages, and the objectives that they have given us to shoot for, this would not have been accomplished."

Foundry process control by statistical methods accomplishes at least six major objectives, D. Meves and J. Ferrell, West Michigan Steel Foundry Company, Muskegon, Michigan, reported. They are: (1) Clearly define process levels so that when a process change is made, the effects of change are readily discernible (control charts present graphic proof as to the merit of change). (2) Clearly show where most time should be spent to eliminate scrap and rework; control charts direct the attention of trouble shooting where it is most needed. (3) Develop cost consciousness by providing a graphic picture of foundry operations and associated costs. (4) Provide means of determining the effects of many variables on casting quality. (5) Guide management by providing a clear and concise picture of foundry operations. (6) Show when trouble is developing, rather than when it is fully developed.

Fabian Bachrach

New Member of ASA Board

Hoyt P. Steele, Executive Vice-President of the Benjamin Electric Manufacturing Company, Des Plaines, Illinois, has been elected as a director of the American Standards Association.

Mr Steele has taken a leading part in standardization work for many years. He has been a member of the Board of Governors of the National Electrical Manufacturers Association, chairman of the Papers Committee and vice-chairman of the National Technical Conference Committee of the Illuminating Engineering Society, and a member of the Technical Committee of the Reflector and Lamp Manufacturers Standards Institute.

The National Electrical Manufacturers Association nominated Mr Steele for membership on ASA's Board of Directors to fill the vacancy caused by the resignation of E. E. Potter, vice-president of General Electric, now in charge of the Washington office.

• • **NEMA President** — The National Electrical Manufacturers Association has announced the election of C. W. Higbee, manager, Electrical Wire and Cable Department, United States Rubber Company as president for 1951. He succeeds Charles T. Lawson, vice-president in charge of sales, Kelvinator Division, Nash-Kelvinator Corporation, Detroit.

International Meetings

A heavy schedule of work on international standardization is now under way. Meetings of technical committees have been scheduled by the International Organization for Standardization or are being planned well into 1952. The schedule is as outlined below.

Meetings Definitely Scheduled

		April, 1951
Gas Cylinders (Subcommittee on Dimensions of Valve Outlets ISO/TC 58/SC 2)	Paris	6, 7
Limits and Fits (Subcommittee on Preliminary Work: Working Parties—Commission on the ISO System and Metrology) ISO/TC 3	Paris	9
Limits and Fits (Subcommittee on Preliminary Work) ISO/TC 3	Paris	10-12
Small Tools (Working Parties on Saws and Files) ISO/TC 29	Paris	12
Small Tools ISO/TC 29	Paris	13, 14
Machine Tools (Working Parties on Definitions and Measurements: Machine Elements; and Conditions of Acceptance) ISO/TC 39	Paris	16-19
Machine Tools ISO/TC 39	Paris	20
		May, 1951
Hermetically Sealed Metal Food Containers ISO/TC 52	Paris	22, 23
Pipes and Fittings ISO/TC 5	Zurich, Switzerland	28-30

Meetings Planned But Not Definite

		1951
Documentation (Working Parties) ISO/TC 46	Brussels	April or May
Textiles ISO/TC 38	Bournemouth, England	June 4-9
Cinematography ISO/TC 36	Geneva, Switzerland	June or July
Sheet and Wire Gauges (Designation of Diameters and Thicknesses) ISO/TC 62	London	After June
Gears ISO/TC 60	Great Britain	Autumn
Drawings (General Principles) ISO/TC 10	Zurich	Autumn
Thread Tolerances ISO/TC 49	Zurich	Autumn
Textile Machinery ISO/TC 72	Netherlands	Autumn
General Definitions Relating to Chemical and Physical Test Results ISO/TC 69	Geneva	September
Documentation ISO/TC 46	Rome	September
Laboratory Glassware ISO/TC 48	London	October or November
Measurement of Fluid Flow ISO/TC 30	Paris	October
Textiles (Subcommittee on Cordages) ISO/TC 38	Paris	October
Pulleys and Belts (Including Vee-Belts) ISO/TC 41	Paris	October
Chemistry ISO/TC 47	Milan	October 22-24
Automobiles (Illuminating and Indicating Lights) ISO/TC 22	Switzerland	October or November
		1952
Automobiles (Mechanical Section) ISO/TC 22	Brussels	Jan or Feb
Photography ISO/TC 42	New York	June

The ISO Council is scheduled to meet in Geneva, Switzerland, July 2 through 7, 1951, and the Council of the International Electrotechnical Commission in Portugal, July 4 through 11. The IEC Committee of Action and six technical committees will also meet in Portugal in July.

Miner Retires

Harold L. Miner, chairman of the Safety Code Correlating Committee of the American Standards Association, retired on October 31 as manager of the safety and fire protection division of E. I. duPont de Nemours and Company. Mr Miner, nationally known for his safety work, has represented the National Fire Protection Association on the SCCC since 1936 and the Manufacturing Chemist Association since 1944. He has also represented the National Fire Protection Association, the Manufacturing Chemists Association, the National Safety Council, and the American Society for Testing Materials on a number of sectional committees. In addition to his other national affiliations, Mr Miner is a past president of the National Fire Protection Association, and is one of the few honorary life members of the NFPA. He has served for many years as a member of the National Safety Council's board of directors.

• • **Argentine Standards Director**—D. Alejandro R. Hermida, civil engineer, has been named General Director of the Instituto Argentino de Racionalizacion de Materiales, Argentina's national standards association. Senor Hermida replaces D. M. A. Ceriale, for many years IRAM's director, who has retired because of ill health.

• • **British Program**—From a report by the Anglo-American Council on Productivity on its third session, October 1950:

"The British Standards Institution is being greatly strengthened and enlarged in order that faster progress may be made in all aspects of standardization and simplification. The Government has urged upon service departments and the nationalized industries the desirability of working with industry through the British Standards Institution to ensure the wider adoption of standardization and simplification in all industrial activities under public control."

AMERICAN STANDARDS

Status as of March 1, 1951

Legend

Standards Council—Approval by Standards Council is final approval as American Standard; usually requires 4 weeks

Board of Review—Acts for Standards Council, gives final approval as American Standard; usually requires 2 weeks

Correlating Committees—Approve standards to send to Standards Council or Board of Review for final action; approval by correlating committee usually takes 4 weeks

Building

In Correlating Committee—

Specifications for Structural Clay-Bearing Wall Tile (Revision of ASTM C34-49; ASA A74.1-1950)
Specifications for Structural Non-Load-Bearing Tile (Revision of ASTM C56-49; ASA A76.1-1950)
Specifications for Structural Clay Floor Tile (Revision of ASTM C57-49; ASA A77.1-1950)
Methods of Sampling and Testing Brick (Revision of ASTM C67-44; ASA A82.1-1944)
Specifications for Gypsum (Revision of ASTM C22-41; ASA A49.1-1941)
Methods of Testing Gypsum and Gypsum Products (Revision of ASTM C26-42; ASA A70.1-1942)
Specifications for Gypsum Plasters (Revision of ASTM C28-40; ASA A49.3-1940)
Specifications for Gypsum Wall Board (Revision of ASTM C36-42; ASA A69.1-1942)
Specifications for Gypsum Lath (Revision of ASTM C37-42; ASA A67.1-1942)
Specifications for Gypsum Molding Plaster (Revision of ASTM C59-40; ASA A49.4-1940)
Specifications for Keene's Cement (Revision of ASTM C61-40; ASA A66.1-1941)
Specifications for Gypsum Sheathing Board (Revision of ASTM C79-42; ASA A68.1-1942)
Sponsor: American Society for Testing Materials
Preparation of Subfloors to Receive Oxychloride Composition Flooring, A88
General Purpose Oxychloride Composition Flooring and Its Installation, A88
Heavy Duty Oxychloride Composition Flooring and Its Installation, A88
Oxychloride Composition Basecoat Flooring and Its Installation, A88
Sponsors: National Bureau of Standards; American Society for Testing Materials

Submitted to ASA for Approval—

Pile Foundations and Pile Structures, A96
Sponsor: American Society of Civil Engineers

American Standard Withdrawn—

Design for Joint Plates for Seven Inch Girder-Grooved and Guard Rails, E2-1923
Design for Joint Plates for Nine-Inch Girder-Grooved and Guard Rails, E3-1923
Design for Seven-Inch Girder-Grooved Rail, E4-1933
Design for Nine-Inch Girder-Grooved Rail, E5-1933
Design for Seven-Inch Girder Guard Rail, E6-1933
Design for Nine-Inch Girder Guard Rail, E7-1933
7-Inch 82 lb Plain Girder Rail and Splice Bars for Use in Paved Streets, E8-1933
7-Inch 92 lb Plain Girder Rail and Splice Bars for Use in Paved Streets, E9-1933
7-Inch 102 lb Plain Girder Rail and Splice Bars for Use in Paved Streets, E11-1933
Sponsor: American Transit Association

Reaffirmation Requested—

Specifications for Sieves for Testing Purposes (ASTM E11-39; ASA Z23.1-1939)
Sponsor: American Society for Testing Materials

Chemicals

In Correlating Committee—

Methods of Chemical Analysis of Yellow, Orange, Red, and Brown Pigments Containing Iron and Manganese (Revision of ASTM D50-36; ASA K44-1937)
Sponsor: American Society for Testing Materials

Electrical

In Board of Review—

Sampling Electrical Insulating Oils, Method of Test (ASTM D923-49; ASA C59.21)
Power Factor and Dielectric Constant of Electrical Insulating Oils of Petroleum Origin, Method of Test (ASTM D924-49; ASA C59.22)
Gas Content of Insulating Oils, Method of Test (ASTM D831-48; ASA C59.23)
Inorganic Chlorides and Sulfates in Insulating Oils, Method of Test (ASTM D878-49; ASA C59.24)
Detection of Free Sulfur in Electrical Insulating Oils, Method of Test (ASTM D981-48T; ASA C59.25)
Natural Block Mica and Mica Films Suitable for Use in Fixed Mica-Dielectric Capacitors, Specification for (ASTM D 748-49; ASA C59.26)
NEMA Standards for Laminated Thermosetting Products (Revision of C59.16-1949)
Method of Testing Sheet and Plate Materials Used in Electrical Insulation (Revision of ASTM D229-46; ASA C59.13-1948)
Sponsor: American Society for Testing Materials
Audiometers for General Diagnostic Purposes, Z24.5
Sponsor: Acoustical Society of America

Rolled Threads for Screw Shells of Electric Lamp Holders and Lamp Bases
Dimensional and Electrical Characteristics of 4-Watt T-5 Preheat Start Fluorescent Lamp, C78.400
Dimensional and Electrical Characteristics of 6-Watt T-5 Preheat Start Fluorescent Lamp, C78.401
Dimensional and Electrical Characteristics of 8-Watt T-5 Preheat Start Fluorescent Lamp, C78.402
Dimensional and Electrical Characteristics of 14-Watt T-12 Preheat Start Fluorescent Lamp, C78.403
Dimensional and Electrical Characteristics of 85-Watt T-17 Preheat Start Fluorescent Lamp, C78.409
Dimensional and Electrical Characteristics of 20-Watt T-12 Preheat Start Fluorescent Lamp, C78.406
Dimensional and Electrical Characteristics of 15-Watt T-8 Preheat Start Fluorescent Lamp, C78.404
Dimensional and Electrical Characteristics of 30-Watt T-8 Preheat Start Fluorescent Lamp, C78.407
Dimensional and Electrical Characteristics of 85-Watt T-17 Preheat Start Fluorescent Lamp, C78.409
Dimensional and Electrical Characteristics of 40-Watt T-12 Preheat Start Fluorescent Lamp, C78.408
Dimensional and Electrical Characteristics of 100-Watt T-17 Preheat Start Fluorescent Lamp, C78.410
Dimensional and Electrical Characteristics of 42-Inch T-6 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.801
Dimensional and Electrical Characteristics of 64-Inch T-6 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.803
Dimensional and Electrical Characteristics of 72-Inch T-8 and Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.805
Dimensional and Electrical Characteristics of 96-Inch T-8 Instant-Start Single-Pin Hot-Cathode Fluorescent Lamp, C78.807
Dimensional and Electrical Characteristics of 20-Millimeter 52-Inch Cold-Cathode Fluorescent Lamp, C78.1100
Dimensional and Electrical Characteristics of 20-Millimeter 64-Inch Cold-Cathode Fluorescent Lamp, C78.1101
Dimensional and Electrical Characteristics of 20-Millimeter 84-Inch Cold-Cathode Fluorescent Lamp, C78.1103
Dimensional and Electrical Characteristics of 20-Millimeter 76-Inch Cold-Cathode Fluorescent Lamp, C78.1102
Dimensional and Electrical Characteristics of 8-Watt T-5 Bactericidal Lamp, C78.1200
Dimensional and Electrical Characteristics of 15-Watt T-8 Bactericidal Lamp, C78.1201
Dimensional and Electrical Characteristics of 20-Millimeter 93-Inch Cold-Cathode Fluorescent Lamp, C78.1105
Dimensional and Electrical Characteristics of 30-Watt T-8 Bactericidal Lamp, C78.1202
Dimensional and Electrical Characteristics of 30-Watt Bactericidal Lamp, C78.1202
Sponsor: Electrical Standards Committee

In Correlating Committee—

National Electrical Code, C1 (Revision of C1-1946 and C1a-1949)
Sponsor: National Fire Protection Association

Highway Traffic

American Standard Just Submitted—

Railroad Highway Grade Crossing Protection, D8.1 (Revision of D8.1-1943)
Sponsor: Association of American Railroads

Mechanical

American Standard Just Published—

Recommended Practice for Mechanical Refrigeration Installations on Shipboard B59.1-1950 $1.00
Sponsor: American Society of Refrigerating Engineers

In Board of Review—

Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe, B36.20 (Revision of ASTM A120-46; ASA G8.7-1947)
Sponsor: American Society for Testing Materials

In Correlating Committee—

Tolerances for Ball and Roller Bearings, B3.5
Sponsor: Mechanical Standards Committee

Specifications for Zinc Coated (Galvanized) Iron and Steel Sheets (Revision of ASTM A93-48T; ASA G8.2-1949)

Specifications for Seamless Copper Water Tube (Revision of ASTM B88-49; ASA H23.1-1949)

Specifications for Brass Wire (Revision of ASTM B134-49; ASA H32.1-1949)

Specifications for Leaded Red Brass (Hardware Bronze) Rods, Bars, and Shapes (Revision of ASTM B140-49; ASA H33.1-1949)
Sponsor: American Society for Testing Materials

Malleable Iron Screwed Fittings, 300 Lbs, B16.19
Sponsors: American Society of Mechanical Engineers; Heating, Piping, and Air Conditioning National Association; Manufacturers Standardization Society of the Valve and Fittings Industry

Submitted to ASA for Approval—

Steel Butt-Welding, B16.9 (Revision of B16.9-1940)
Sponsors: American Society of Mechanical Engineers; Manufacturers Standardization Society of the Valve and Fittings Industry; Heating, Piping, and Air Conditioning National Association

Mining

In Board of Review—

Tumbler Test for Coke (Revision of ASTM D294-29; ASA K20.3-1936)
Sponsor: American Society for Testing Materials

Optics

In Correlating Committee—

Method of Spectrophotometric Measurement of Color, Z58.7.1 (Revision of Z44-1942)

Method for Determination of Color specifications, Z58.7.2 (Revision of Z44-1942)

Alternative Methods for Expressing Color Specifications, Z58.7.3 (Revision of Z44-1942)
Sponsor: Optical Society of America

Photography

American Standards Just Published—

Dimensions for Photographic Dry Plates (Inch Size), Z38.1.30-1951 (Revision of Z38.1.30-1944) $.25

Flash Synchronizing Equipment Bipost-Type Connecting Cord Ends and Pins, Z38.4.26-1951 $.25

Flash Synchronizing Equipment Bayonet-Type Connecting Cord Ends and Pins, Z38.4.27-1951 $.25
Sponsor: Optical Society of America

Safety

In Board of Review—

Safety Code for Installing and Using Electrical Equipment in and About Coal Mines, M2.1 (Revision of M2-1926)
Sponsors: American Mining Congress; Bureau of Mines, U. S. Department of Interior

Standardization on NPA Orders

Increasing interest in standardization and simplification as a means of conservation has been indicated in National Production Authority orders recently. The following have come to the attention of the American Standards Association during the past month:

Rubber Products—NPA order reduces the number of types and styles of tires, inner tubes, and industrial rubber goods that a manufacturer may produce; permits manufacturer of truck tires to make one line each of standard tread-depth and extra tread-depth tires. Farm tractor and implement tires are limited to a single line; passenger car tires to black sidewalls only. Only one line and one quality is permitted in standard tread-depth passenger car tires as well as in extra tread-depth passenger car tires.

Slack Cooperage—A six-man task group has been appointed to study production bottlenecks in the industry and possible conservation measures, such as stave standardization.

Plumbing Brass Goods—NPA urged the industry, which manufactures faucets, shower heads, tubs, and other plumbing to standardize its products, simplify design, and reduce the thickness of plating wherever practicable. Industry pointed out that plating of plumbing fixtures is necessary for sanitation purposes.

Boilers and Related Equipment—A four-man task group has been appointed to study conservation of critical materials, standardization, and simplification of boiler design.

Jacks—It has been suggested that certain types of jacks might be eliminated: 1½-ton bumper jacks; 1½-ton axle jacks; and 2-ton equipment jacks. Other model eliminations might be made later.

Extended Surface Heating Equipment—Reduction of the number of sizes and types now being produced in the industry was discussed as a means of producing more units of equipment and maintaining continuous operation.

Pulp, Paper, and Board—Industry representatives suggested that savings could be made by standardizing and simplifying some of their products, referring especially to reductions in the basic weight of paper and establishment of uniform styles of paper forms used in offices, schools, and industry. Retailers would be able to reduce their inventories considerably, they said.

• • **Canadian Standards**—W. R. McCaffrey, General Manager of the Canadian Standards Association, has announced that the 1951 List of CSA Standards is now available upon request. The List contains the titles and prices of all CSA Specifications which are available by writing to the CSA Head Office at Ottawa. Standards listed concern civil engineering, mechanical engineering, Canadian Electrical Code Part I Inside Wiring Rules, Part II Approvals Specifications, Part III Outside Wiring Rules, Part IV Radio, Part V Mines, railway work, ferrous metals, non-ferrous metals, steel construction, welding, photography, timber, safety codes, and many miscellaneous subjects.

"Open-Tank" Operator

(*Continued from page* 110)

Inc; W. B. Witheridge, Ventilation Consultant, General Motors Corp.

The subcommittee held four meetings in 1948 resulting in the preparation of a subcommittee draft dated December 23, 1948. After submission of this and a first revised draft of Z9 Committee meetings on April 14 and October 24, 1949, respectively, a second revised draft was sent out for letter ballot on November 21, 1949. Final revisions were made on May 31, 1950, to meet objections brought to light by the letter ballot. After unanimous Z9 Committee acceptance of these final revisions, the proposed standard was submitted to the three sponsoring organizations for their final acceptance. Their acceptance was granted in the fall of 1950, clearing the way for final acceptance as an American Standard by the American Standards Association.

The Open-Tank Standard sets a pattern which the Z9 Committee proposes to pursue further in the development of ventilation requirements for other unit-operation processes. The goal is a similar standard for each of the principal dust, gas, vapor, fume, and mist-producing unit operations in industry. Work is currently in progress on the development of standards for safety and ventilation of surface-coating operations and of solid material-handling operations, The subcommittees working on these two proposed standards have Professor Leslie Silverman of Harvard University and John Kane of the American Air Filter Company as their respective chairmen.

Concurrent with the development of these unit-operation standards, work has been under way on a revision of the report on Fundamentals Relating to the Design and Operation of Exhaust Systems, Z9. It is anticipated that this revision will be completed some time this year. Dr Allen D. Brandt of the Bethlehem Steel Company is chairman of the subcommittee doing this work.

In conclusion, it should be stressed that the American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks will give the best results if it is applied by persons expert in both the technology of the processes to be controlled and the technique of industrial ventilation. Only a thorough understanding of the chemistry and physics of a process will reveal the gases, vapors, or mists likely to be generated by the process, and only a thorough understanding of the engineering principles involved in process ventilation will allow the choice of the best method of control for each particular job.

Next Gaillard Seminar

The next private seminar on the organization and operation of company standardization work will be held by Dr John Gaillard in the Engineering Societies Building, New York City, from June 18 through 22, 1951. Those interested in details and registration are invited to write Dr Gaillard at his home address, 400 West 118 Street, New York 27, N. Y., or phone him at ASA, Murray Hill 3-3058. Places may be reserved by advance registration.

The seminar held from January 22 through 26, 1951, was attended by twelve conferees representing eight companies, as follows: The Bristol Company (2); Collins Radio Company; Joy Manufacturing Company; The M. W. Kellogg Company; A. V. Roe Canada Ltd (2); Saco-Lowell Shops; Stewart-Warner Corporation (2); and Whitin Machine Works (2). This raises the number of organizations so far represented at the Gaillard Seminars to 73 and the number of conferees, to over one hundred.

• • **Holland's New Standards Director**—In a formal announcement, just received, Mr J. A. Teyinck has informed ASA that he has retired as Secretary of the Hoofdcommissie voor de Normalisatie in Nederland (the national standardization organization) and as Director of the Centraal Normalisatiebureau (headquarters for the organization). Mr F. Van Teutem, who has been serving as Vice-Director of the CNB, succeeds Mr Teyinck as Secretary of HCNN and Director of CNB.

Rappoport Studies

Farrer Joins ASA

The American Standards Association welcomes H. E. Farrer as a member of its Electrical Department Staff. Mr Farrer, who retired in 1949 as assistant to the secretary of the American Institute of Electrical Engineers, replaces S. David Hoffman, who has been called into active service with the United States Navy. As lieutenant in Naval Reserve, Mr Hoffman is serving on the USS Johnston.

Mr Farrer is thoroughly acquainted with standards in the electrical field. While with AIEE he served as secretary of the AIEE Standards Committee and acted as AIEE representative on the Electrical Standards Committee of the American Standard Association.

Mr Farrer had been a member of the AIEE headquarters staff in New York since 1915. Before joining the staff of AIEE, he was associated with the Sprague Electric Works of the General Electric Company where he worked as technical assistant in advertising, publications, and sales. In 1915 he joined the AIEE headquarters staff as assistant to the editor of AIEE publications. Three years later he was appointed secretary to the Board of Examiners, and in 1923 added the duties of the secretary of the Standards Committee to his responsibilities. Mr Farrer was a director of the board administering the New York City office of the Engineering Societies Personnel Service.

What's New on American Standard Projects

Protective Lighting for Industrial Properties, A85

Sponsor: Illuminating Engineering Society

A sectional committee is now being organized by the sponsor. The IES Protective Lighting Committee is preparing a draft standard on this subject which will be submitted to this sectional committee as soon as it is available.

Safety Code for Forging and Hot Metal Forming, B24

Sponsors: Drop Forging Association; National Safety Council

A draft revision of the American Standard Safety Code for Forging and Hot Metal Stamping, B24-1927, is now out to letter ballot of the sectional committee. If approved, it will be sent to the sponsor for submittal to ASA.

Dimensional Standardization of Bolts, Nuts, Rivets, and Similar Fasteners, B18

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

A proposed revision of American Standard Track Bolts and Nuts, B18d-1930, is now being circulated for comment and criticism. This revision was prepared by subcommittee four on track bolts and nuts of Sectional Committee B18. C. B. Bronson, assistant to vice-president, New York Central System, is chairman of this subgroup.

The proposed standard contains tables of dimensions of oval neck track bolts, elliptic neck track bolts, and track bolt nuts. These tables give the nominal diameter over thread, head, neck, length under head, minimum thread length, and threads per inch for the various bolts. The nominal diameter, width across flats, thickness, and chamfer is given for the nuts. The standard also refers to satisfactory material specifications.

In developing this standard the committee studied all types of track bolts and nuts used by the various railroads in the U. S. and Canada. Extensive series of tests were run to develop the strength characteristics of nuts in various sizes and thicknesses. These tests were carried on at the Norfolk and Western Railroad Laboratory under joint direction of G. M. Magee and R. P. Winton.

Copies of this proposed standard may be obtained by writing to D. M. Shackelford, Standards Department, American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y.

Electrical Measuring Instruments, C39

Sponsor: Electrical Standards Committee

As a result of a meeting of subgroup 2 on classification and requirements of subcommittee 2 on electrical recording instruments, February 2, an abstract of the Association of Edison Illuminating Companies specifications for electric appliances will be circulated to members of the group. Considerable discussion was held on the subject of dielectric and insulation resistance tests, particularly on the question of the conditions under which the two tests should be made. The AEIC specification limits the leakage current (at rated voltage) to 0.2 milliampere under humid and operation conditions. Members of the subgroup will study this specification and comment on it at the next meeting.

During a discussion on chart paper, a tabulation of the various physical tests made of nine samples of chart paper was submitted to the committee. The figures submitted will serve as a possible base from which a paper specification might be built.

Reported by H. Koenig, Chairman Subgroup 2.

Electrical Insulating Materials in General, C59

Sponsor: American Society for Testing Materials

Ralph R. Batcher of the Radio-Television Manufacturers Association has just been named RTMA representative on the C59 committee. The RTMA recently requested representation on this committee.

Measurement of Test Voltage in Dielectric Tests, C68

Sponsor: American Institute of Electrical Engineers

The C68 committee met in New York, January 22, and reviewed the first draft of the proposed new standard. In addition to minor changes in portions of the 1942 edition, new material has been added which should appreciably increase the accuracy of measurements of surge voltage values of less than one microsecond duration. The need for this has been recognized for some time. The committee hopes to complete its version of the new standard before the end of the year.

Reported by J. T. Lusignan, Chairman C68.

Standards for Motion Pictures, PH22

Sponsor: Society of Motion Picture and Television Engineers

The Proposed American Standard for Sound Transmission of Perforated Projection Screens, PH22.82/3 has been sent to letter ballot of sectional committee PH22. This proposed standard was published in the July, 1950, *Journal of the Society of Motion Picture and Television Engineers* for comment and criticism. As no adverse comments were received, the standard has been sent to committee PH22 for approval.

This proposed standard is based on the American War Standard Sound Transmission of Perforated Projection Screens, Z52.44-1945, which was withdrawn on September 8, 1949.

Dimensional Standards for Kitchen Utensils and Containers for the Mass Feeding Industry, Z64

Sponsor: National Restaurant Association

As a result of the first meeting of ASA Committee on Dimensional Standards for Kitchen Utensils and Containers for the Mass Feeding Industry, February 9, a draft standard will be forthcoming within the next couple of months. The committee was organized to develop these standards as a result of a general conference of all parties-at-interest, October 23, 1950. The National Restaurant Association is the sponsor for this project.

At this first committee meeting a subcommittee was appointed to draft a standard for kitchen utensils, including pots, pans, and trays, etc, for the mass feeding industry. The subcommittee divided itself into two smaller committees, one to work on terminology, and the other on sizes. Members of this subcommittee are: Mrs Mary de Garmo Bryan, *chairman*, representing the National Restaurant Association; A. W. Dana, American Hotel Association; Margaret Gillam, American Hospital Association; B. E. Hiles, Aluminum Wares Association; L. Marshall Land, Revere Copper and Brass, Inc; G. L. Anderson, Department of the Army, Quartermaster Corps; W. H. Rudolph, National Electrical Manufacturers Association; Lucile Streater, American Dietetic Association and National Retail Dry Goods Association; Mildred Hearn, General Foods Corporation; and P. P. Logan, National Restaurant Association.

A second subcommittee was appointed to consider other equipment used in kitchens and dining room work that might be considered for future standardization. Members of this group are: P. P. Logan, *chairman*, representing the National Restaurant Association; Lucile Streater, American Dietetic Association, and the National Retail Dry Goods Association; A. W. Dana, American Hotel Association; and Margaret Gillam, American Hospital Association.

Letter Symbols and Abbreviations for Science and Engineering, Z10

Sponsor: American Society of Mechanical Engineers

Use of the American Standard Letter Symbols for Aeronautical Sciences, Z10.7-1950, in all future reports on aerodynamics was announced by the Bumblebee Aerodynamics Panel. This action took place at the Fourteenth Regular Meeting of the Panel, San Diego, California, December 5 and 6, 1950. The Bureau of Ordnance, U. S. Department of the Navy, sponsors the Bumblebee program of research and experimentation in the guided missile field. The Panel is the aerodynamics section of this vast program.

The following paragraph is quoted from the official report of the Panel:

> The Panel further recommended that the list of aeronautical symbols recently approved and recommended by the American Standards Association, as interpreted by the Handbook Staff of the Applied Physics Laboratory, be adopted immediately in the preparation of all Bumblebee reports.

Definitions of Electrical Terms, C42

Sponsor: American Institute of Electrical Engineers

At a meeting, January 24, subcommittee V of C42 reviewed proposals for definitions of electrical terms pertaining to industrial control. These proposals had been obtained from subcommittee members, the AIEE Committee on Industrial Control, and the Industrial Control Section of the National Electrical Manufacturers Association.

Members of the subcommittee agreed that C42 should record definitions in general use, and that it should not coin new definitions. Therefore, the subcommittee accepted those definitions which appeared to be non-controversial, and they are being forwarded to the sectional committee for action. Any definitions of a controversial character were held back, and they may be reconsidered for a later revision of American Standard C42.

Reported by G. W. Heumann, Chairman, Subcommittee V.

ABC COUNTRIES' CONFERENCE ON DRAWING

As Reported by the Canadian Standards Association in its "Quarterly Bulletin," January 1951.

November 24th marked the close of a two-week Conference which will undoubtedly have far-reaching effects upon the industrial relationship between America, Britain, and Canada.

This series of meetings was sponsored by the military authorities of the ABC countries for the purpose of establishing uniform practices applying to engineering drawings which may be exchanged between the three countries in normal times as well as periods of emergency.

Subjects discussed included such items of importance as:

Dimensioning and Tolerancing,
Surface Roughness, Waviness and Lay,
Limits and Fits.

and many other features relating to the successful interpretation of mechanical drawings.

A wide field of agreement was reached and the recommendations of the conference will be carried back by the various delegates for ratification by the appropriate authorities in each of the three countries.

In addition to military personnel, the United Kingdom and Canada delegates included industrial engineers representing the British Standards Institution and the Canadian Standards Association, respectively.

It was the consensus of opinion of the conference that at this time the interest of each nation would best be served by the publication of suitable standards by the responsible authorities and while agreeing in principle, may vary to some extent in the method of presentation.

The Canadian Standards Association will undertake the work of preparing and publishing appropriate Canadian Standards and there is every hope that such standards will be forthcoming in the not too distant future.